PER COGNITIONEM VISUALEM

The Visualization of Cognitive and Natural Processes in the Middle Ages

Edited by José Higuera Rubio

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Per cognitionem visualem
The Visualization of Cognitive and Natural Processes in the Middle Ages

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Edited by
José Higuera Rubio

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In Memoriam
Mariae Cândida Pacheco
quae Philosophicae Medii Aevi Historiae
in Universitate Portucalensi
vias munivit et diligenter auxit.

Foreword

José Higuera

This volume offers an overview of medieval representations of knowledge under a philosophical perspective. The study of imagery examples and thinking practices introduced by a diverse scholars seeks to explore representation uses, analytical approaches on perception, and the context's transmission of visual frameworks. Incidentally, contemporary studies on diagrammatic thought systematize those complex relations into scientific practices, perceptual patterns, and contextual insights. The undeniable value of visual tools linked with knowledge spreading and learning practices during the Middle Ages assemble manuscript traditions, intellectual practices, and philosophical debates. Visual tools, frequently appearing in Medieval manuscripts, have often been considered "illustrative material" intended to facilitate textual comprehension. However, these visual frameworks offer something more than a straightforward correspondence between a conceptual interpretation and its figurative depiction. They are, in fact, key to understanding the methods of acquiring and shaping knowledge through visual frameworks with didactical, disputational or heuristic purposes.

In four sections, this volume attempts to tackle those complex questions, gathering contributions presented to the XXV SIEPM Colloquium at Porto–Instituto de Filosofia, delayed to June of 2021 as a consequence of COVID-19's social contact restrictions. The first section points out the overlapping of tree-diagrams in dialectical representations, biblical narratives, and Lullian art. The second introduces the reading patterns of prognosis through astrological and geomantical figures. The third revisits the accuracy of language concerning perceptual and metaphysical content. Finally, the last section deals with the variables of visual properties around mirrors and physical motion.

The way to attempt this quest certainly matched very well with the intellectual environment generously offered by the Instituto de Filosofia (Universidade do Porto/IF-FLUP) for organizing the XXV SIEPM Colloquium. Actually, the Instituto de Filosofia had been shaped from

the start, in 1997, by the only Iberian research institution focused on the medieval history of thought: the Gabinete de Filosofia Medieval (GFM), founded by Prof. Maria Cândida Pacheco in 1987. As SIEPM's assessor and vice-president (1992-2002), author of many studies, and a committed promoter of prolific researching careers, Prof. Pacheco – who passed away in 2020 – deserves fervent recognition in this volume, with strong grateful feelings from the community of medieval philosophy studies. The editor would also like to thank the SIEPM Bureau for its support and engaged participation in this virtual colloquium, especially SIEPM's President, Prof. Maarten Hoenen, and SIEPM's General Editor, Prof. Alessandra Beccarisi, for supporting the publication of this volume.

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Introduction

The Medieval Diagrammatic Turn

José Higuera Rubio

Medieval Studies, in a broad sense, have tackled representations as a part of the written culture, which can see through its different appraisals and transformations concerning philosophical and scientific issues. Nevertheless, the way in which visualizations modify the comprehension of texts and their transmission, along with the transformations of philosophical concepts, has yet to be studied profoundly. The XXV SIEPM Colloquium "*Per cognitionem visualem*. The Visualization of Cognitive and Natural Processes in the Middle Ages," held virtually in Porto in June of 2021, proposes the study of visual tools, which has a premodern origin, considered from the perspective of natural phenomena visualization, intellectual operations concerning visual perception, and knowledge experiences. Those aspects eventually convert diagrams in something more than a text interpretation enhancement instrument. They represent demonstrative tools, prognostic means, mystical tasks, and also a mimetic tool to spot natural phenomena – sometimes veiled to perception – such as planetary motions, calendars, inner physical changes, and the discrete composition of matter.[1]

[1] C. Meier-Staubach, "Die Quadratur des Kreises: die Diagrammatik des 12. Jahrhunderts als symbolische Denk und Darstellungsform", in *Die Bildwelt der Diagramme Joachims von Fiore*, hrsg. v. A. Patschovsky, Ostfildern 2003, 23-53; L. Queiroz, "Iconografia atomística e o papel da imagem segundo Gaston Bachelard", *Kriterion* 58,138 (2017), 637-652. B. Eastwood and G. Grasshoff, *Planetary Diagrams for Roman Astronomy in Medieval Europe*, Ca. 800-1500, Philadelphia 2004; B. Eastwood, *Ordering the Heavens: Roman Astronomy and Cosmology in the Carolingian Renaissance*, Leiden 2007; M. Carruthers, *The Craft of Thought. Meditation, Rhetoric, and the Making of Images*, 400-1200, Cambridge 1998; A. Esmeijer, Divina Quaternitas. *A Preliminary Study in the Method and Application of Visual Exegesis*, Assen-Amsterdam 1978; F. Wallis, "Images of Order in the Medieval Computus", in

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On this line, Aby Warburg[2] proposed gathering the intricate patterns of visual representations to figure out how concepts, emotions, or even mythical characters change over time. His breakthrough methodology caught the attention of Ernst Cassirer and Erwin Panofsky. The last one reached an interesting point in his essay about the relationship between Gothic architecture and scholastic teaching. So close to him is Cassirer's recovery of human cosmic image,[3] full of geometrical and mystical aspects from Charles of Bovelles' works. Bovelles, as member of Stapulense's circle, makes me think of the recurrent idea of how the philosophy of symbolic forms[4] got its primary sources from medieval visualizations transmitted by manuscripts or through Romanic and Gothic architecture.

Perhaps we should revisit Panofsky's analogy between Architecture and Scholasticism.[5] When you wander along Saint Jacques way, in

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ACTA XIV: Ideas of Order in the Middle Ages, ed. W. Ginsberg, Binghamton 1990, 45-67; F. Wallis, "Signs and Senses: Diagnosis and Prognosis in Early Medieval Pulse and Urine Texts", in *Social History of Medicine* 13 (2000) 265-278; *The Power of Images in Early Modern Science*, ed. W. Lefèvre, J. Renn, U. Schoepflin, Berlin 2012; C. Lüthy, "What Does a Diagram Prove that Other Images Do Not? Images and Imagination in the Kepler-Fludd Controversy", in *Image, Imagination, and Cognition: Medieval and Early Modern Theory and Practice*, ed. C. Lüthy, C. Swan, P. Bakker, 227-274.

[2] C. Johnson, *Memory, Metaphor, and Aby Warburg's Atlas of Images*, Ithaca 2012, 64-65: "When he [A. Warburg] presents the Atlas as a way of mapping the *Wanderstraßen der Kultur*, Warburg literally and figuratively points to cartography as the model for his historical vision. Not only, as we saw, did he have actual maps prepared for the opening panel, but the essentially spatial epistemology of the Atlas, with its metonymic and diagrammatic logics, would discover how cultural change circulates between east and west, north and south, as well as how it is affected over time."

[3] E. Cassirer, *Individuum und Kosmos in der Philosophie der Renaissance*, Leipzig-Berlin, 1927.

[4] E. Cassirer, "The Concept of Symbolic Form in the Construction of the Human Sciences (1923)", in *The Warburg years (1919–1933): essays on language, art, myth, and technology*, ed. S. Lofts and A. Calcagno, New Heaven 2013, 78:"It is the force of producing that configures the contents of mere sensation and perception into symbolic contents. Here, the image has ceased to be something simply received from the outside; it has become something formed from the inside in which a fundamental principle of free forming prevails. This is the achievement that we see take place in particular "symbolic forms," in language, myth, and art. Each of these forms not only takes its starting point from the sensuous but remains constantly enclosed in the sphere of the sensuous. It does not turn against the sensuous material but lives and creates itself in it."

[5] E. Panofsky, *Gothic Architecture and Scholasticism*, Philadelphia 1976, 44. "In its

Bierzo – a region of Leon in Spain – one can find on a Romanic Capella an anthropomorphic figure – a harpy – that mixes a bird body with a human head looking at you from the façade with a harsh attitude[6]. This mythical mix between animal and human being is reminiscent of the Aristotelian works about animals, a source of medieval medicine together with Albertus Magnus' or Petrus Hispanus' Commentaries.[7]

We have definitely lost our awareness about the animal background behind human healing and the subtle connection between human body and nature. Right now, it's a mainstream worry. Suppose we reconsider Cassirer's perspective and Warburg's project as symbolic animals whom we are undoubtedly. Thus, we should figure out how symbolic forms and visual representations spread the complexity of philosophical knowledge in prolific ways shaping our cognition like a straightforward act of seeing.

Some of XXV SIEPM Colloquium's presentations suggested the premodern emergence of visual knowledge tools, which I would eventually call "diagrammatic turn."[8] This intellectual event transformed

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imagery, the High Gothic cathedral sought to embody the whole of Christian knowledge, theological, moral, natural, and historical, with everything in its place and that which no longer found its place, suppressed."

[6] The *Bestiaire d'amours*' scene of the Harpy's recognition in a mirror shows: S. Kay, *Animal Skins and the Reading Self in Medieval Latin and French Bestiaries Illustrated*, Chicago 2017, 121. "[...] man's original similarity to God at creation, [and] the dissimilarity produced by the fall [...] Her ability [of Harpy] to perceive physical difference as theological similarity emphasizes that resemblance in the sense of *similitudo* involves not visual data but personal transformation. On the other hand […] she does have a human face and hair, so the Harpy really does looks like a human and really does recognize herself as such [...]".

[7] Petrus Hispanus, *Questiones super libro De Animalibus Aristotelis*, ed. F. Navarro Sánchez, London 2015; Albertus Magnus, *De animalibus libri XXVI*, ed. H. Stadler (Beiträge zur Geschichte der Philosophie des Mittelalters 15-16), Münster 1916-1921; *Aristotle's Animals in the Middle Ages and Renaissance*, ed. C. Steel, G. Guldentops, P. Beullens, Leuven 1999.

[8] J. Hamburger, "The Diagram as Paradigm in Medieval Art—and Beyond", in Id., *Diagramming Devotion: Berthold of Nuremberg's Transformation of Hrabanus Maurus's Poems in Praise of the Cross*, Chicago 2020, 13-32: "On peut en dire autant de toutes les branches de la science, où l'on voit que les diagrammes n'ont pas seulement pour but de clarifier l'explication d'une théorie, mais en deviennent le coeur et l'objet même […]Ces diagrammes innombrables devaient permettre de résoudre et d'exposer les legs de la science antique à la culture chrétienne, et aussi de développer,

the interpretation of texts, and their vocabulary, with the introduction of perceptual variables that highlighted the visualization of epistemic procedures. This perspective implies going beyond research that attributes certain textual tradition to a set of representations, such as historiography has done. On the other hand, some presentations handled epistemic and perceptual operations arranged through linguistic and logic protocols showing the concern on visual perception and its link with objects and the subject who experiences them.

The interpretation of medieval representations – diagrams, charts, cosmographers, trees, graphics – inserted in medieval manuscripts largely depends on the texts and their tradition.[9] That perspective was not unfamiliar among medieval masters who saw rivalry – perhaps dangerous – between texts and images. At that time, the question was if images were only a backing to express the deep sense conveyed by texts. In this regard, the image seemed to amplify the meaning of texts as an instrument of transmission to an audience lacking writing education and Latin knowledge. Despite the Renaissance changes, such as the circulation of printed texts and the growth of reading culture, historiography still interprets those images from an instrumental point of view. The representations are studied as a medium that bears the meaning of texts and their tradition. Diagrams are seen as "visual aids", or "illustrative material", which increases opportunities of teaching, understanding, and disseminating texts and their contents.

It is a complex task to specify at what point of the coexistence of representations and texts the intensification of the autonomous use of diagrams occurred. This fact was determined by the "imitation" of natural and intellectual processes[10] rather than the interpretation of texts

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dans les monastères puis les écoles urbaines et l'université, des modes d'acquisition et de diffusion du savoir propres à ces milieux," J. C. Schmitt, *Penser par figures*, Paris 2019, 17, 22.

[9] J. E. Murdoch, *Album of Science*, New York 1984; P. Sicard, *Diagrammes médiévaux et exégesè visuelle: le 'Libellus de formatione arche' de Hugues de Saint-Victor*, Turnhout 2008; P. Salonius and A. Worm, *The Tree. Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought*, Turnhout 2014.

[10] J. Meirinhos, "Dessiner le savoir: un schéma des sciences du XIIe siècle dans un manuscrit de Santa Cruz de Coimbra", in *Itinéraires de la raison. Études de philosophie médiévale offertes à Maria Cândida Pacheco*, éd. J. Meirinhos, Louvain-la-Neuve 2005, 187-204.

or the reference to specific meaningful traditions.[11] Obviously, it does not exclude a relation with the text; on the contrary, it is possible to establish how some scientific and philosophical texts are structured from a set of representations. In those instances, the text performs as an instrument to increase image knowledge and the meaning that it reveals. This happens on astronomical, physical or geometric works, in which diagrams represent natural phenomena, or intellectual procedures, that the text merely describes. The representation suggests something more than the meaning of the terms since it is aimed at visualizing intellectual operations and mimicking natural phenomena.[12]

The Artificial Visualization of Knowledge

The theater of natural vision depends on object recognition and allows us to update the map of the external world, at the same time acting and learning based on visual stimuli. These complex relations occur when a person establishes visual contact with a "sparkling artifact" full of informative sections generating an active perception of thinking practices. This *Bildwissenschaft* allows us to do things with pictures. The "logocentrism" of linguistic communication, or "speech acts," opens the path to "acts of depiction."

The purpose of the intellectual visualizations and natural phenomena simulation is to launch hypotheses about how nature operates based on "diagrammatic experiments" and "diagrammatic reasonings."[13] The consequence of this detachment from the textual tradition, and its interpretation, is the formulation of other theories, other models of understanding that left behind the discussion about vocabulary seeking to encourage, through visualizations, the self-sufficiency of the subjects'

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[11] B. Obrist, "Le diagramme isidorien des saisons, son contenu physique et les représentations figuratives", in *Mélanges de l'Ecole française de Rome. Moyen-Age* 108 (1996), 95-164.

[12] P. Lang, *'fortuna Diagrammatica': Das Rad Der Fortuna als Bildhafte Verschluesselung Der Schrift – 'de Consolatione Philosophiae' Des Boethius*, Frankfurt am Main 2009; D. Di Liscia, "The 'Latitudines breves' and Late Medieval University Teaching", in *Sciamvs* 17 (2016), 55-120; A. Even Ezra, "Visualizing Narrative Structure in the Medieval University: 'divisio textus' Revisited", in *Traditio* 72 (2017), 341-376.

[13] F. Stjernfelt, *Diagrammatology: An Investigation on the Borderlines of Phenomenology, Ontology, and Semiotics*, New York 2007, 156.

inner rational language. To introduce this concept in light of its medieval background, the participants of XXV SIEPM Colloquium pointing out the following topics:

Diagrammatic Categories

The opening point is the classification of representations – diagrams, graphs, trees, charts, cosmographers – from the perspective of their relationship with one specific discipline. Therefore, it is possible to study how one specific representation fulfils the conditions that one discipline requires according to its key concepts and objects of study. In the same manner that a medieval *divisio scientiarum*[14] existed, there is also a sort of *diagrammatic division* whose characteristics gather the different knowledge requirements manifested by each discipline. There is, in this regard, a tripartite division: in the first place, the compilation, division, hierarchization, and opposition created on notions, concepts or categorizations.[15] In this way, the diagrams are categorized, first, regarding the specific order of knowledge that represents; second, regarding a set of intellectual operations; and third, regarding the natural objects.

This first section gathers the late scholastic tradition in Latin America (Roberto Hofmeister Pich), the artistic manifestations of Italian architecture (Pippa Salonius), and the vernacular emergence of visualizations by Ramon Llull (Albert Soler). The overlapping of tree-diagrams takes place in the three examples: dialectical representations, biblical narrative sculpted on a church architecture, and the Lullian trees. For the first time, one can grasp the diverse manifestation of the same iconic pattern: tree branches.

Diagrams, Perception, and Knowledge

Once this classification has developed, it will consider the relationship between the different types of diagrams and how they are perceived through their visual disposition. The query will explore how the "soul

[14] Flaccus Albinus Alcuinus, *De dialectica*, Zürich, Zentralbibliothek, Ms. C 80, (c. IX), f. 110v.

[15] Raimundus Lullus, *Compendium logicae Algazelis*, Bayersiche Staatsbibliothek 10544, f. 88r.

eye" is something more than an analogy of natural vision since it is possible to describe "intellectual vision" and the aspects of knowledge intimately related to the making of diagrams. On that point, an intellectual vehicle that conducts the interpretation of the text emerges, also highlighting other ways of accessing knowledge. Hence, representations give rise to a new relation between data from natural perception and the visual – physiological and intellectual – faculty, since visualization devices become a tool for constructing knowledge from contact with natural objects. This activity introduces meaningful changes in how the perception of natural objects is considered in relation to visual artefacts.

The second section introduces the prognosis reading patterns through an astonishing language of points inserted into astrological and geomantical figures (Arianna Dalla Costa). The reading of the figures and the approach to its archetypical language suggest a complex composition of visual reading in which the future is a section addressed by a set of points disposition (Alessandro Palazzo).

And the third section revisits the issue of intentionality in relation to perceptual operations, and how vision became the background of knowledge. Through examples that come from different authors, between the 13th and 14th centuries, scholars from EE UU (Peter John Hartman), Colombia (Nicolás Vaughan), Portugal (Maria Manuela Brito Martins), and Georgia (Tamar Tsopurashvili) explore the problem of intentionality of visual representations and perceptual concepts. There are challenging questions such as the accuracy of language to represent perceptual contents, time and reflection, the emergence of intentionality from perception and the metaphysical links between perception and representation.

Reproduction and Dissemination of Medieval Diagrammatic Models

The next step will be to address how changes on perceptual relations, between natural objects and visual artifacts, were received during the first modernity. It is remarkable the quantity of editions during the 16th – 17th centuries dedicated to reproducing representations arising from medieval manuscripts, as well as the imitation of knowledge visualiza-

tion processes of the original works.[16] The visualization of intellectual processes such as demonstration, deduction, or induction; and finally, the imitation of nature and the visualization of natural phenomena. The most important examples are found in the disciplines of *quadrivium*, e. g. astronomy and geometry, and in the studies about perspective, machine construction, or predictive and prophetic texts. Early modernity emphasised imitating representations, trying to show that imitation was, first of all, a form of material and visual transformation of natural objects.

The fourth section deals with the notion of experience concerning variables of natural and supernatural knowledge. The properties of mirrors (Francesca Galli) and visions of mystical inspiration (Yael Barash) could compare with manifestations of physical motion (José Higuera).

Finally, what is the Diagrammatic Turn?

In the following centuries (15th – 17th) the diagrammatic emergence is characterized by the reference to a subject whose capacity of representation constitutes its main access to knowledge. The representation is a faculty by itself, as it was for the medieval masters too. Representation becomes, above all, a way of performing intellectual operations, as well as a device to formulate experiences that are linked to hypotheses about natural objects. The diagrams tended to offer the subject's self-representation while seeking knowledge. Their images provide the interpretation of the meaning that guides the modeling of intellectual processes and the explanation of nature. Diagrams were characterized by their explanatory capacity, since they generated a deductive or demonstrative process. In this sense, visualization aims to reflect reasoning and offer a control device for natural knowledge.

It is thus possible to study the *diagrammatic turn* from its medieval background to the Early Modern reproductions and its Modern resonances, according to the visualization parameters of intellectual procedures and the imitation of natural phenomena.

[16] Guilelmus de Conchis, *Dragmaticon*, Cologne, Fondation Martin Bodmer, Cod. Bodmer 188, 32r; Gossuin de Metz, *L'image du monde*, British Library, Harley, 4333, 58v; 60v.

The complex medieval use of representations implied the amplification of the texts' meaning and their tradition, but also the representation of intellectual processes such as organizing knowledge, demonstrations and predictions. Furthermore, diagrams tried to mimic the occurrence of unseen natural phenomena such as the motion of heavens and the composition of matter. The reproduction of medieval diagrammatic models during the first modernity (15th – 17th centuries), occurred explicitly due to the circulation of printed texts, some of which were editions of medieval works.

"Diagrammatic experiences" stirred the use of representations aimed at the autonomous development of intellectual procedures involving natural objects and hypotheses about natural performance. These diagrammatic devices played a crucial role among intellectual operations in the Modernity (16th – 18th centuries), formulating experiences and consolidating hypotheses and theories. In some sense, philosophical subjectivity is built over representations as a novel intellectual faculty in which the outcomes of the human quest for knowledge are constructed[17].

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[17] A. Verboon, *Lines of thought: diagrammatic representation and the scientific texts of the Arts Faculty, 1200-1500*, Leiden 2010; A. Even-Ezra, *Lines of Thought: Branching Diagrams and the Medieval*, Chicago 2021.

Part I

Diagrams and Graphics

Dialectics, Visual Tools and Methods of Learning. Exploring Visual Cognition in Manuscripts on Logic by Jesuit Masters from Ecuador (17th-18th Centuries)

Roberto Hofmeister Pich

Introduction

As it has been exemplarily demonstrated by the North-American scholar, educated at the University of Texas (at Austin), Walter B. Redmond,[1] who published in 1972 an inventory of colonial philosophical works titled *Bibliography of the Philosophy in the Iberian Colonies of America*,[2] during the so-called colonial period the teaching of theoretical philosophy in Latin American higher education institutions basically adopted the *cursus philosophicus* – of logic, natural philosophy, and metaphysics – imported from Salamanca and Alcalá de Henares. The works of Aristotle was the basis of the several *cursus philosophici* read in Latin American learning centers. Terministic and Aristotelian logic – or, in other words, (a) "minor" logic grounded (very loosely) on Peter of Spain's *Summulae logicales*[3] and more directly on early-mod-

[1] The contributions by Walter B. Redmond, Mauricio Beuchot, and Celina Ana Lértora Mendoza to the history of Latin American Scholasticism were described in the following studies: R. H. Pich, "Recepção e desenvolvimento da escolástica barroca na América Latina, séculos 16-18: notas sobre a contribuição de Walter Bernard Redmond", in *Scripta Mediaevalia* 2 (2011), 1-22; R. H. Pich, "Antecedentes à investigação filosófico-historiográfica da escolástica colonial: a contribuição de Mauricio Beuchot", in *Cauriensia* 6 (2011), 37-64; A. S. Culleton, "Antecedentes a la investigación filosófico-historiográfica de la escolástica colonial. La contribución de Celina Lértora Mendoza", in *Cauriensia* 6 (2011), 23-35.

[2] W. B. Redmond, *Bibliography of the Philosophy in the Iberian Colonies of America*, The Hague 1972.

[3] See Petrus Hispanus [Petrus Hispanus Portugalensis], *Tractatus (called afterwards Summule logicales)*, ed. L. M. De Rijk (Philosophical Texts and Studies 22), Assen 1972, 1-232.

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ern versions of it, such as the *Summulae dialecticae* by 16th century masters such as Domingo de Soto,[4] and (b) "greater" logic which included commentaries on Porphyry's *Isagoge* and Aristotle's logical works[5] – were continuously studied. In those fields of philosophy all *magistri* were of course influenced by Aristotle, but in many cases they were also in search of systematic presentations that would be loyal to leading intellectual minds of their traditions, such as Aquinas for the Dominicans, Scotus for the Franciscans, and to a certain extent both Aquinas and Scotus, as well as Francisco Suárez, for the Jesuits.[6] In

[4] See Dominicus a Soto, *Summulae*, Salamanca 1554-1555 [first edition 1529] (repr., with a Preface by W. Risse, Hildesheim-New York 1980). See also E. J. Ashworth, "The Post-Medieval Period", in *The Cambridge Companion to Medieval Logic*, ed. C. D. Novaes and S. Read, Cambridge 2016, 174, 178, 180, 190-191.

[5] W. B. Redmond, "Latin America, Colonial Thought in", in *The Routledge Encyclopedia of Philosophy*, ed. E. Craig, London-New York, Vol. 5, 1998, 421-422. See also, among many studies, W. B. Redmond, *La lógica en el Virreinato del Perú*, Lima 1998; W. B. Redmond, *La lógica del Siglo de Oro. Una introducción histórica a la lógica*, Pamplona 2002; W. B. Redmond, "La lógica mexicana de Antonio Rubio. Parte I. El ser real y no real. El ente de-razón lógico en la lógica mexicana de Antonio Rubio", in *Metafísica y persona* 10:19 (2018), 123-141; W. B. Redmond, "La lógica mexicana de Antonio Rubio. Parte II. En su origen y en la historia", in *Metafísica y persona* 10:20 (2018), 137-155; W. B. Redmond y M. Beuchot, *La lógica mexicana del Siglo de Oro*, Ciudad de México 1985; W. B. Redmond y M. Beuchot, *Pensamiento y realidad en fray Alonso de la Vera Cruz*, Ciudad de México 1987; M. Beuchot, *Antología de fray Alonso de la Vera Cruz*, Morelia 1988; *Fray Alonso de la Veracruz: Antología y facetas de su obra*, ed. M. Beuchot y A. Gómez Robledo, Morelia 1992; W. B. Redmond y M. Beuchot, *La teoría de la argumentación en el México colonial*, Ciudad de México 1995.

[6] See for example Ioannes de Espinoza Medranus, *Philosophia thomistica seu Cursus philosophicus Duce D. Thoma Doctore Angelico peractus*, Roma: Ex Typographia Reu. Cam. Apost., t. I, 1688; W. B. Redmond, "Latin American Colonial Philosophy: The Logic of Espinosa Medrano", in *The Americas – Academy of American Franciscan History* 30 (1974), 475-503; Hieronymus Valera, *Commentarii ac quaestiones in universam Aristotelis ac subtilissimi Doctoris Ioannis Duns Scoti logicam*, Lima: Apud Franciscum a Canto, 1610; Ioannes de Fuica, *Commentaria phylosophica ad mentem Doctoris Subtilissimi Patris Fratris Ioannis Duns Scoti Saccratissimi Ordinis Minorum, et Theologorum Principis*, Santiago de Chile, Archivo Histórico Franciscano, 1687–1689, 297ff.; R. H. Pich, "*Scholastica colonialis*: Notes on Jerónimo Valera's (1568–1625) Life, Work, and Logic", in *Bulletin de Philosophie Médiévale* 54 (2012), 65-107; R. H. Pich, "Jerónimo Valera's (1568–1625) Scotistic Account on the Nature and Properties of Logic", in *Mediaevalia – Textos e Estudos* 31 (2012), 187-234. R. Marconi Juárez, *La idea de filosofía en Miguel de Viñas. S.I. en su contexto histórico-cultural* (Ph.D. Thesis in Philosophy, Instituto de Filosofía de la

particular, in Peru and Mexico the Spaniards created a higher education system early on modeled after the practices of Salamanca and Alcalá Universities.[7] Peru was the site of the first university in the Southern Hemisphere (the "Real Universidad de la Ciudad de los Reyes," today Universidad Nacional Mayor de San Marcos in Lima), which opened on May 12th, 1551.[8] In Mexico, where the "Real y Pontificia Universidad de México" (today somehow refounded as Universidad Nacional Autónoma de México), had opened on September 21st, 1551, the Augustinian Friar Alonso de Veracruz (born 1504 in Spain, died 1584 in Mexico) was, after assuming his position in 1553, arguably the first university professor of logic *ex officio*.[9] Alonso de Veracruz had studied grammar and rhetoric in Alcalá and completed his theological education in Salamanca, where Francisco de Vitoria and Domingo de Soto were among his teachers. In 1554 Veracruz wrote the first work on philosophy in the Americas, a textbook of logic divided in two volumes, that is, *Recognitio summularum* and *Dialectica resolutio*. Moreover, in

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Pontificia Universidad Católica de Chile), Valdivia 2021, 180-91, has demonstrated that many Jesuits, including Miguel de Vinãs (1642–1718), who during his magisterial activity in the Colegio Máximo de San Miguel (Santiago de Chile) wrote his *Philosophia scholastica* (published 1709, in Genoa), defended the idea that the Company of Jesus should find in Francisco Suárez (1548–1617) – the "Doctor Eximius" – the guiding mind of its theological and philosophical teaching. Jesuits would belong to the "school of Suárez" (*Jesuitica vel Suaristica Schola*), which at any rate should be closely related to the thought of Thomas Aquinas.

[7] Rich information about colonial libraries and the history of higher education institutions in colonial Latin America can be found in R. H. Pich, "Books and Libraries in South American Colonial Convents and Universities: How, Why, and What?", in *Die Bibliothek – The Library – La Bibliotheque. Denkräume und Wissensordnungen*, hrsg. v. A. Speer und L. Reuke (Miscellanea Mediaevalia 41). Berlin-Boston 2020, 534-556; R. H. Pich, "*Scholastica colonialis*", in *Vocabulário de Tomás de Aquino*, ed. J. Savian Filho e C. A. R. do Nascimento, São Paulo 2022, [in print]. See also R. H. Pich, A. C. Storck and A. S. Culleton, "Introduction", in Homo – Natura – Mundus*: Human Beings and Their Relationships* (Rencontres de Philosophie Médiévale 22), Turnhout 2020, xxi-xlv.

[8] One has to concede that the "Real y Pontificia Universidad de Santo Tomás de Aquino" (in Santo Domingo, nowadays the Dominican Republic) was created even earlier, by papal bull, on October 28th, 1538. But it has to be said too that it began to operate with royal approval only in 1558. See also Á. M. Rodríguez Cruz, *La historia de las universidades hispanoamericanas. Periodo hispano*, Bogotá, 2 Vols., 1973.

[9] See references in footnote 5, above. See also M. Beuchot, *Historia de la filosofía en el México colonial*, Barcelona 1996, 124-136.

1557 *magister* Alonso de Veracruz finished a work on philosophy of nature, which was titled *Physica speculatio*.[10]

A rich and institutionally-based intellectual life – particularly in the fields of philosophy and theology – can also be testified with regard to colonial Ecuador.[11] Before its independence from Spain in the 19th Century, the territory of today's Ecuador was, at different times, part both of the Viceroyalty of Peru and of New Granada. In this country we find a significant volume of old imprints and philosophical manuscripts from the colonial period. The most important materials are those that were once held at the library of the prestigious Universidad de San Gregorio, founded under Jesuit administration on September 15th, 1622, and officially closed in 1769.[12] Hundreds of manuscripts by Jesuit masters have survived, most of them to be found today at the Archivo Histórico Nacional del Ecuador (in the so-called "Fondo Biblioteca de los Jesuitas") and at the Biblioteca Ecuatoriana Aurelio Espinosa Pólit,[13] which is a Jesuit "Fundación" dedicated to research

[10] Alphonsus a Vera Cruce, *Recognitio Summularum Reverendi Patris Ildephonsi a Vera Cruce Augustiniani Artium ac Sacrae Theologiae Doctoris*, Mexicus: Excudebat Ioannes Paulus Brissensis, 1554; Alphonsus a Vera Cruce, *Dialectica resolutio cum textu Aristotelis edita per Reverendum Patrem Alphonsum a Vera Cruce Augustinianum, Artium atque Sacrae Theologiae Magister*, Mexicus: Excudebat Ioannes Paulus Brissensis, 1554; Alphonsus a Vera Cruce, *Physica speculatio, edita per R.P.F. Alphonsum a Vera Cruce, Augustinianae familiae Provincialem, artium ac sacrae Theologiae Doctorem*, Mexicus: Excudebat Ioannes Paulus Brissensis, 1557.

[11] See specific information about academic production by theologians and philosophers in Colonial Ecuador in M. Sánchez Astrudillo, *Textos de catedráticos jesuitas en Quito colonial – Estudio y Bibliografia*, Quito 1959. See also S. M. Guerra B., *La filosofia escolastica en Quito colonial 1534–1767*, (Pontificia Universidad Católica del Ecuador, Facultad de Ciencias Humanas – Departamento de Filosofía), Quito 1976, especially 274-338.

[12] Although it has to be acknowledged that the first attempted university in Quito was the Universidad de San Fulgencio, founded in 1603 by the Augustinians, who grounded a Convent 1573. See also G. Moncayo, *La Universidad de Quito. Su trayectoria em tres siglos 1551–1930*, Quito 1944; P. Costales y A. Costales, *Los Agustinos: pedagogos y misioneros del pueblo (1573–1869)*, Quito 2003, 62-81. See also L. Pacheco, "Evaluación histórica de la Universidad en el Ecuador: 1603–2010", in *Simposio Permanente sobre la Universidad 3. Historia de la Universidad en el Ecuador: sus principales hitos*, Quito 2011, 13-14.

[13] More exactly, the "Fundación Biblioteca Ecuatoriana Aurelio Espinosa Pólit" (FBEAEP). It was founded already 1929 as a "Biblioteca Archivo." The Jesuit Aurelio Espinosa Pólit (1894–1961) was a man of letters and university professor; he was one

in history, humanities, and natural sciences, as well as a library of a distinguished kind.[14] In both archives manuscripts on the first part of the *cursus philosophicus*, i.e., on *logic*, outnumbers manuscripts on *physicalia* and *metaphysicalia*. Unsurprisingly, works on logic by Ecuadorian masters also focus on minor and greater logic, as they were characterized before. It should be added now that magisterial expositions of logical themes in the form of *summulae dialecticae* or the like were usually expositions with more didactical purposes. In particular, they explore logical concepts and issues that appear when examining human thought or intellect by analyzing the performances of human reason, such as apprehension, judgment, and argumentation.[15] In summulistic writings, masters used to organize their expositions by *libri*, "treatises," "disputes," "conferences," "sections," and "questions." In summulistic literature, doctrinal synthesis is a desideratum, but this does not prevent authors from discussing controversial issues in detail and carefully justifying their own views regarding both theories and

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the founders of the Pontificia Universidad Católica del Ecuador (PUC-E).

[14] The Jesuit Francisco Piñas, a historian who lives and works at the "Fundación," is the best acquainted person on the history of libraries, old imprints and manuscripts in Ecuador, at least regarding the Society of Jesus' colonial holdings. Francisco Piñas' several works are a most valuable source of information about Jesuit institutions in the country, as well as about old catalogues and inventories of Jesuit colonial libraries and archives. Francisco Piñas Rubio S.J. published his works in the Digital Library Miguel de Cervantes: F. Piñas, *Catalogo de la Provincia de Quito de la Compañía de Jesús en la Colonia 1586–1767*, Alicante 2006; F. Piñas, *Resumen del Archivo de los Jesuitas del Colegio Máximo en la Real Audiencia de Quito*, Alicante 2006; F. Piñas, *Inventario del Colegio Máximo de Quito de la Compañía de Jesús y sus haciendas durante su secuestro el 20 de agosto de 1767*, Alicante 2007; F. Piñas, *Cartas Annuas de la Compañía de Jesús en la Audiencia de Quito de 1587 a 1660*, Alicante 2008; F. Piñas, *El arquitecto hermano Marcos Guerra, S.J. y su obra*, Alicante 2008; F. Piñas, *Inventario de la Universidad de San Gregorio de la Compañía de Jesús durante su secuestro en 1767*, Alicante 2008; F. Piñas, *Inventario del Colegio Seminario de San Luis de Quito y sus haciendas durante su secuestro en 1767*, Alicante 2008; F. Piñas, *Libro de composiciones de tierras del Colegio de la Compañía de Jesús hechas por Antonio de Ron em 1696*, Alicante 2008; F. Piñas, *Resumen de libros y papeles de los jesuitas y Colegio Máximo de Quito, expatriados*, Alicante 2011.

[15] Taking into consideration the Peruvian master of arts Jerónimo Valera OFM (1568–1625), these characteristics of the *summulae dialecticae* or *logicales* were shown in the following studies: Pich, "*Scholastica colonialis*: Notes on Jerónimo Valera's (1568–1625) Life, Work, and Logic", 65-107; Pich, "Jerónimo Valera's (1568–1625) Scotistic Account on the Nature and Properties of Logic", 187-234.

teaching methods. This is where *didactical* and *visual* tools are offered, and they are essentially two in kind: (i) squares of oppositions and (ii) Porphyrian or metaphysical trees.[16] In fact, a third kind of didactical tool can be found as well, in a few cases, namely (iii) schemes that summarize what figures and rules have to be known by heart in order to master syllogistic reasoning.[17] At any rate, there is a frequent use of diagrams of opposition, behind which we find the doctrine of proposition as a second logical form resulting from reason's judging acts. The theory *of proposition* and the theory *of (propositional) opposition* seem to have been particularly important for Ecuadorian masters of arts from colonial times[18] – and, since logical manuscripts from that period, in Ecuador, are well preserved, there is a good material basis for comparing those master's theories and teaching tools or skills. Their use of beautifully drawn and quite ingeniously conceived squares of opposition both reveal didactical concerns and theoretical attempts of improving what scholastic traditions had said about oppositions. In the

[16] See, for example, Petrus a Campo SJ, *Logicales philosophici cursus disputationes*, Quito, Fundación Biblioteca Ecuatoriana Aurelio Espinosa Pólit, 1711, Tractatus Quintus ("De praedicamentis, sive cathegoriis"), Disputatio Secunda ("De praedicamentis"), Caput Primum – De substantia. In quo consistat conceptus formalis substantiae, ut distinctae ab accidentibus, f. 154r.

[17] See, for example, Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus* [1706], Quito, Archivo Histórico Nacional, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, Disputatio Quarta ("De argumentatione, et syllogismo"), Conferentia Secunda – De figuris, et modis syllogismorum, f. 49r.

[18] On the theory of proposition in medieval thought, see the following referential studies: G. Nuchelmans, *Theories of Proposition*. *Ancient and Medieval Conceptions of the Bearers of Truth and Falsity* (North-Holland Linguistic Series 8), Amsterdam-London, 1973; G. Nuchelmans, "The Semantics of Propositions", in *The Cambridge History of Later Medieval Philosophy*. *From the Rediscovery of Aristotle to the Disintegration of Scholasticism 1100–1600*, ed. N. Kretzmann, A. Kenny and J. Pinborg, Cambridge 1982 (repr. 1997), 197-210; G. Nuchelmans, "Proposition", in *Historisches Wörterbuch der Philosophie*, hrsg. v. J. Ritter und K. Gründer, Basel-Stuttgart, Band 7, 1989, col. 1508-1525; D. Perler, "Einleitung", in *Satztheorien – Texte zur Sprachphilosophie und Wissenschaftstheorie im 14. Jahrhundert*, hrsg. v. D. Perler (Texte zur Forschung 37), Darmstadt 1990, 1-56; D. Perler, *Der propositionale Wahrheitsbegriff im 14. Jahrhundert* (Quellen und Studien zur Philosophie 33), Berlin-New York, 1992; L. Cesalli, "Propositions: Their Meaning and Truth", in *The Cambridge Companion to Medieval Logic*, ed. C. D. Novaes and S. Read, Cambridge 2016, 245-264.

following, I will characterize the use of 'squares' of oppositions by three different authors from the 17th and the 18th centuries – all of them Jesuit masters of arts who taught at the Universidad de San Gregorio, in Quito: Ignacio Gil Castelvi, Hyacinto Basilio Morán, and Faustino Páez.[19]

1. Ignacio Gil Castelvi and the *Tractatus in universam Aristotelis dialecticam* (1665)

The *Summulae dialecticae* are the very first part of the *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, by Ignacio Gil Castelvi SJ, finished 1665.[20] In Dispute IV "On the Enunciation or Proposition," Castelvi defines proposition as "the internal act [of the intellect] that is purely [*simpliciter*] judicative."[21] Proposition, thus, is primarily taken as "propositio mentalis." It essentially is identical with or is the result of a mind's act of judgment – how a proposition is related to the capacity of meaning things in "affirmation" or "negation" and to "truth" and "falsity," these are things that can be speculated only on the basis of that "common conception" (*ratio communis*). Any proposition allows for four kinds of consideration: about its "matter" (*materia ex qua*, parts of the formal proposition; *materia circa quam*, parts of the objective proposition), its "form" (affirmation; negation), its "quantity," and its "quality" (truth; falsity). Concerning quantity, a proposition is either "universal," "singular," "indefinite," or "particular," and quantity means in these cases

[19] Strictly speaking, it is yet to be checked whether Faustino Páez was a professor at the Universidad de San Gregorio. We are told that he was a Spaniard. I am assuming that he worked in Ecuador and that it is at least the case that his philosophical manuscripts were read and used at the Ecuadorian university. See Redmond, *Bibliography of the Philosophy in the Iberian Colonies of America*, 64.

[20] Ignacio Gil Castelvi's surviving manuscript comprises a complete *cursus philosophicus*: (a) *Summulae*; (b) *Dialectica*; (c) *In libros Aristotelis Physicorum*; (d) *Tractatus in metaphysicam de ente*; (e) *Tractatus in tres libros Aristotelis De anima*; (f) *Disputationes in duos libros Aristotelis De ortu, et interitu, sive de generatione, et corruptione*.

[21] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus* [1665], Quito, Fundación Biblioteca Ecuatoriana Aurelio Espinosa Pólit, *Tractatus artis dialecticae*, Disputatio Quarta ("De enuntiatione, sive propositione"), Caput Primum – Quid sit propositio?, f. 13r.

the proposition's extension in order to represent either "several or just a few objects."[22] Linguistically, the quantity of a proposition is indicated by a "note" (*nota*) connected to its subject, which means more or less a linguistic resource for the role played by quantifiers in contemporary logical jargon.[23] Presupposing these intrinsic properties of propositions, Castelvi affirms, then, that propositions have three relative properties, that is, "opposition" (*oppositio*), "equivalence" (*aequipollentia*), and "conversion" (*conversio*).[24] This is how he defines opposition: "Repugnance [*repugnantia*] of one proposition to another, having the same subject, being made of copula and predicate according to affirmation and negation."[25]

Castelvi does not think that we can have a univocal concept of opposition, but only an analogous one based on a double key: opposition of one proposition to another according to affirmation, and opposition of one proposition to another according to negation. "Proposition" is a univocal concept indeed to the many different propositions, but not opposition, after all "the repugnance of one proposition excludes the other proposition, to which it opposes."[26] By so understanding the definition of opposition, Castelvi is aware that he does not go along with important authors such as João Poinsot OP (1589–1644), Juan Martínez de Prado OP (????–1668), Pedro Hurtado de Mendoza SJ (1578–1641),

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[22] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, Caput Secundum – De materia[,] forma[,] quantitate[,] et qualitate propositionis, f. 13v.

[23] A discussion on quantifiers in contemporary logic and metaphysics can be found in S. Haack, "Quantifiers", in *Contemporary Readings in the Foundations of Metaphysics*, ed. S. Laurence and C. Macdonald, Oxford 1998, 55-68.

[24] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, Caput Tertium – De oppositione propositionis, f. 14r.

[25] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 14r: "[...] repugnantia unius propositionis cum alia eodem subiecto[,] copula et praedicato constante secundum affirmationem et negationem."

[26] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 14r: "[…]: quia repugnantia unius propositionis excludit aliam cui opponitur; […]."

Rodrigo de Arriaga SJ (1592–1667), the *Conimbricenses*,[27] and Domingo Lince OP (17th century). Moreover, as already alluded in the definition of the non-univocal concept, there are several conditions that must be met in order for someone to logically state that propositions oppose to each other: two opposite propositions need to have the same subject, the same predicate, as well as the same circumstances of signification such as time and place; in addition, their terms must have the same properties such as "supposition" (*suppositio*), "scope" (*ampliatio*), "restriction" (*restrictio*), and "designation" (*appellatio*). Otherwise there is no opposition between propositions.[28]

Quite traditionally, Castelvi affirms that there are four kinds of opposition. (1) The first is contradictory opposition, which is the "repugnance" of one proposition to another regarding being simultaneously true or false: two contradictory propositions cannot be at the same time true or at the same time false; if one of them is true, then the other one is false, and vice versa. Granted the note already done about the quality of contradictory propositions, Castelvi explains this first kind of opposition according to criteria of propositional form and propositional quantity – this and the other three oppositions we can see in the *tabula* in Figure 1,[29] which is the only diagram found in Castelvi's works as they came to us today. (2) The second opposition is the contrary opposition (as the one between an affirmative universal proposition and a negative universal proposition), (3) the third opposition is the subcontrary opposition (as the opposition between one affirmative particular proposition and one negative particular proposition). Finally, (4) the fourth opposition is the subordinate opposition (as the opposition between an affirmative universal proposition and an affirmative particular

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[27] See in this regard M.S. de Carvalho, "Cursus Conimbricensis," in *Conimbricenses.org Encyclopedia*, ed. M.S. de Carvalho and S. Guidi, doi = "10.5281/zenodo.3234133", URL = "http://www.conimbricenses.org/encyclopedia/cursus-conimbricensis/", latest revision: May, 28th, 2019, especially the Section "The Science of Logic: Discovery, Teaching and Demonstration" and "§ 3: The science of logic: discovery, teaching and demonstration – Bibliography."

[28] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 14r.

[29] The diagram can be found in Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 15r.

proposition or between a negative universal proposition and a negative particular proposition).[30] As our Jesuit master says, all this should be easily *perceived* by means of a table or "figure" (*figura* - Figure 1).[31]

By discussing in a further Chapter "Whether all enumerated oppositions are properly [*proprie*] and rigorously [*rigorose*] oppositions," which is something one should deny, for only "contradictory opposition" is a rigorous opposition – because both propositions compared have no "conformity" (*convenientia*) and mutually exclude any simultaneity of truth and falsity, as well as of affirmation and negation –, Castelvi makes further analyses of propositional opposition. He proposes some rules for identifying the nature of opposition in each case, such as: (i) contradictory propositions can neither be true nor be false at the same time; (ii) contrary propositions – which constitute an opposition that "is not rigorous about falsity" – cannot be true, but they can be false at the same time; (iii) subcontrary propositions – which constitute an opposition that "is not proper about truth" – can both be true at the same time, but not false at the same time; (iv) subordinate propositions are such that both can be true or false and affirmative or negative at the same time: in such propositions, it is only the case that one is subsumed under the other. Because of this, subordinate propositions simply do not constitute a "proper opposition." After all, one proposition's being included in the other does not amount to being opposed to it.[32] In fact, we can only talk about a "rigorous" opposition in contrary and subcontrary propositions as long as those oppositions can be reduced to a contradictory opposition, and this is something that happens each time, respectively, either about the non-simultaneity of truth (contrariety) or about the non-simultaneity of falsity (subcontra-

[30] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 14v.

[31] Of course, such a figure is supposed to make the understanding of propositional oppositions easier; see Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 3, f. 14v: "[…]: quae omnia facile percipies in hac figura."

[32] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, Caput Quartum – An omnes oppositiones enumeratae sint proprie et rigorose oppositiones, f. 15r.

riety). According to Castelvi, since only contradictory opposition can be proper and rigorous, the fourfold division of oppositions cannot be proper and rigorous either.[33]

Turning back to our author's diagram of oppositions, it cannot go unnoticed the fact that it is actually a flower-like diagram, not a table or a square rigorously speaking. It is not known yet when such diagrams were conceived or introduced in Ecuador, but masters of arts after Castelvi follow quite often this pattern. We can of course see in this a kind of creative attempt of teaching oppositions with motives that should be more akin to the audience in a country so vividly characterized by environmental diversity and natural beauty and exoticism in flora and fauna. In fact, flowers, plants, threes, and birds feature quite often as illustrations in Ecuadorian philosophical manuscripts. But perhaps this is not simply artistic freedom and unconstrained imagination, with no substantial logical meaning. Perhaps there is a conceptual point in such attempts. After all, a flower with, say, four times four petals[34] – considering the circles inside which the propositions are written as a kind of petals as well – consists in a quite natural and unified structure, having the same *dictum* at the core. A *dictum* should be understood here as the objective proposition or the combination of judgment with objective meaning.[35] Around the same *dictum* as identical *materia circa quam* – which will be, according to its meaning, either "necessary," "impossible," or "contingent"[36] – opposed propositions can be constructed.

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[33] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 4, ff. 15r-15v.

[34] The image also has four little flowers drawn inside the (what can be taken as) third level of 'petals.'

[35] I use "objective meaning" here simply as a synonym for "what is meant" by the intellect's internal act of judging. I leave it, thus, especially in the case of the same *dictum about which* there is opposition – which tends to be expressed in an indefinite proposition, i.e., a proposition whose subject is just a common term –, undecided between "judgment content," "objective meaning," and "object of judgment." However, I do think that the *opposed* propositions usually have, according to texts that were investigated, either "objective meaning" or "object of judgment." See again Cesalli, "Propositions: Their Meaning and Truth", 263.

[36] Ignatius Gil Castelvi SJ, *Tractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus*, Quito, FBEAEP, *Tractatus artis dialecticae*, disp. 4, c. 2, f. 13v.

2. Hyacinto Basilio Morán and His *Cursus philosophicus triennalis* (1706)

In fact, in the topics of "What is a proposition?" and "What are its properties?," such as the property of opposition, we find substantial philosophical debates among Jesuit masters of arts and the preparation of rather ingenious didactical tools to correctly understand oppositions. We move now to the *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus* by Hyacinto Basilio Morán, from the year 1706.[37] He was also a professor at the Universidad de San Gregorio, and in the manuscript of his *Tractatus primus summularum sive summulae praeceptorum dialecticae* we find a significant number of tables or squares of opposition. In their complexity and characteristics, they reveal new concerns in the debate on propositions. With regard to the definition of proposition, Basilio Morán observes that Aristotle offered different accounts in the *Perihermenias* and the *Analytica priora*, defining "proposition" or "discourse" (*oratio*) (a) either in terms of quality (in the *Perihermenias*,[38] it is "the oration that signifies the true or the false," which is an account for the sake of scientific demonstration) (b) or in terms of form (in the *Analytica priora*,[39] it is the "oration" that is "either affirmative or negative" and nothing else, which is rather an explanation for the sake of "the construction of the syllogism" (*fabrica syllogismi*)).[40]

Leaving without treatment, here, Basilio Morán's detailed exposition of the four kinds of division that apply to proposition,[41] it should

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[37] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, Quito, AHN.

[38] See Aristoteles, *Hermeneutik oder vom sprachlichen Ausdruck*, in *Kategorien und Hermeneutik oder vom sprachlichen Ausdruck*, hrsg. v. H.G. Zekl (Philosophische Bibliothek 493), Hamburg 1998, 1 16a11-13, 96-97; 4 16b33 – 17a1-7, 100-101.

[39] See Aristoteles, *Erste Analytik*, in *Aristoteles – Erste Analytik / Zweite Analytik*, hrsg. v. H.G. Zekl (Philosophische Bibliothek 494/495), Hamburg 1998, I 1, 24a16-17.2-3.

[40] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, Disputatio tertia ("De Propositione"), f. 35v.

[41] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, Conferentia Prima – Quod sit propositio; et in quas species dividatur?, ff. 36v-38r.

be emphasized now that, for him – as for Castelvi before him –, "opposition," "equivalence," and "conversion" are the relative properties of proposition. In particular, his definition of logical opposition, in which he combines Aristotle's views of opposition in *Perihermenias* and *Analytica priora*,[42] is sophisticated: it is "the formal repugnance, in the intentional way [*ex modo tendendi*], of two propositions that are formed by the same subject, the same predicate, and under the same circumstances."[43] Apparently, Basilio Morán thinks of proposition as 'mental proposition' too. If there is, thus, an opposition between propositions as intentional acts or acts of judgment about something, then those two acts differ in their logical performance – which can include both propositional form and quantity – about the same *dictum*: they say opposed things about the same material or objective proposition. If the condition of having (i) the same subject and the same predicate does not need explanation, it should be said that the condition of (ii) being considered "under the same circumstances" means the same "mode," "place,", "time," "designation," supposition," "condition," and "quality."[44] Predictably, our master of arts confirms the view that there are four kinds of opposition and explains contrary, subcontrary, subordinate, and contradictory oppositions in a traditional fashion,[45] although he makes the remark that contradictory opposition between two *singular* propositions such as "Peter is white" and "Peter is not white" is

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[42] On Aristotle's theory of opposition, see, for example, W. Kneale e M. Kneale, *O desenvolvimento da lógica*, trans. M. S. Lourenço, Lisboa 1991, 56-69; R. M. Dancy, *Sense and Contradiction. A Study in Aristotle*, Doredrecht-Boston 1975; J. P. Anton, *Aristotle's Theory of Contrariety*, Lanham 1987; M. J. Hoheleuchter, *Kontrarietät. Explikation in Auseinandersetzung mit Aristoteles*, Münster 1988; F. Morales, Antikeimena. *Untersuchungen zur aristotelischen Auffassung der Gegensätze*, Frankfurt a. M. u. a. 1991.

[43] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, Conferentia Tertia – De oppositione propositionum, f. 40r: "[…]: repugnantia formalis ex modo tendendi duarum propositionum, constantium eodem subiecto, et praedicato et sub eisdem circunstantiis."

[44] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 3, f. 40r.

[45] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 3, ff. 40r-40v.

sometimes understood as a contradiction outside the laws of Aristotle's logic and table of oppositions.[46] Singular contradictory propositions are left out indeed of the first square of oppositions offered by Basilio Morán. In fact, in contemporary analyses of the 'canonical Aristotelian-Boethian square of oppositions,' which is structured according to Aristotle's four categorical sentence types (A-E-I-O), attempts have been made to extend the traditional square – towards what is called an "hexagon of opposites," in order to accommodate logical relations involving "singular affirmation" and "singular negation" too.[47] Although Basilio Morán does not follow a flower-like pattern in drawing his diagram, the beautiful image is attractive and richly adorned with birds, plants, leaves, flowers, and what seems to be flower nectaries too (Figure 2).[48]

In a Chapter about the "General Laws of Contradictory Opposition," which is again propositional opposition at its highest degree, Basilio Morán affirms, as a first rule, that for one proposition being *the contradiction* of another proposition, it is required that it does not deny

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[46] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 3, f. 40v: "Contradictoria est, quae reperitur inter duas propositiones quarum una est affirmativa et altera negativa, una universalis, altera particularis, verbi gratia "omnis homo est albus", "aliquis homo non est albus". Hic additur oppositio contradictoria singularis quae reperitur inter duas propositiones singulares, unam affirmativam, et alteram negativam, verbi gratia "Petrus est albus", "Petrus non est albus". Aliqui vocant has propositiones singulares contradictorias ex[tra] leges; quia non servant leges, dialecticae aristotelicae. Ergo omnia ex sequenti tabula melius percipientur."

[47] See D. Jacquette, "Subalternation and Existence Presuppositions in an Unconventionally Formalized Canonical Square of Opposition", in *Logica universalis* 10 (2016), 191-195; L. Choudhury and M. K. Chakraborty, "Singular Propositions, Negation and the Square of Opposition", in *Logica universalis* 10 (2016), 218-221. As it is well known, the propositional oppositions of the so-called 'square of oppositions' are essentially Peripatetic as exposed in Aristotle's *On Interpretation*, although the square or the diagram as such goes back to Apuleius of Madaura and Boethius. See in this regard M. Correia, "Boethius on the Square of Opposition", in *Around and Beyond the Square of Opposition*, ed. J. Y. Béziau and D. Jacquette, Basel 2012, 41-52. See also D. Londey and C. Johanson, "Apuleius and the Square of Opposition", in *Phronesis* 29 (1984), 165-173.

[48] Figure 2 is found in Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 3, f. 41r.

more than what is necessary to, *as an opposition*, falsify the affirmative proposition; if an opposed proposition does it, it will rather be a *contrary* proposition.[49] If "Everyone is running" is falsified in case "Someone is not running" is true, it is obviously not necessary to assume that "Nobody is running" for making the first proposition false.

But what is certainly more interesting in studying propositional oppositions and the topic of visual tools for understanding and learning them is that Basilio Morán – as many other masters from the Universidad de San Gregorio as well[50] – expands the use of diagrams of opposition to several other kinds of propositions beyond simple categorical propositions characterized by form, quantity, and quality. Other kinds of proposition have the property of opposition as well, and this is most clear in Basilio Morán's "Conference" with regard to "explainable" and "modal" propositions (*propositiones exponibiles*; *propositiones modales*).[51] *Exponibiles* are those propositions that are somehow "dif-

[49] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive sumulae praeceptorum dialecticae*, disp. 3, Conferentia Quinta – Leges generales oppositionis contradictoriae, f. 43r: "[…] ex quo sit prima lex cum Divino P. Josepho Mor[ell]: ad oppositionem contradictoriam, requiritur quod propositio [negativa] praecise neget id quod sufficit et oportet ad aliam affirmativam falsificandam; unde illa propositio, quae plus negat, quam oportet ad aliam falsificandam non erit contradictoria, sed contraria. […]. Ergo […] quod propositio sit alterius contradictoria requiritur quod non plus neget, quam oportet ad falsificandam affirmativam." Perhaps Basilio Morán in referring to Josep Morell (1649–1696), a Catalan Jesuit, who taught philosophy at the College of the Jesuits in Palma de Mallorca. At least three of his works – on logic, philosophy of nature, and metaphysics – are preserved in manuscripts in Ecuadorian archives; see Redmond, *Bibliography of the Philosophy in the Iberian Colonies of America*, 64. See also Iosephus Morell SJ, *Introductio ad logicam sive summularum declaratio, auctore R. P. Iosepho Morell Societatis Iesu in Palmario Jesuitico Montis Sion Collegio* [1682], Quito, Archivo Histórico Nacional.

[50] Nicolás de Cisneros and Faustino Páez, mentioned in this study, are examples of this.

[51] On explainable and modal propositions, and their oppositions, in medieval logic see, for example, N. Kretzmann, "*Syncategoremata*, *exponibilia*, *sophismata*", in *The Cambridge History of Later Medieval Philosophy*. *From the Rediscovery of Aristotle to the Disintegration of Scholasticism 1100–1600*, ed. N. Kretzmann, A. Kenny and J. Pinborg, Cambridge 1982 (repr. 1997), 212-216, 218-230; E. J. Ashworth, "The Doctrine of *Exponibilia* in the Fifteenth and Sixteenth Centuries", in *Vivarium* 11:2 (1973), 137-167; E. A. Moody, *Truth and Consequence in Mediaeval Philosophy*, Amsterdam 1953, 53-63; S. Knuuttila, "Modal Logic", in *The Cambridge History of*

ficult" and "obscure" and need to be explained by means of other propositions. So are, for instance, those propositions which contain exclusive particles in a certain part of its structure, such as "just, only, only up to this extent" (*tantum, solus, dumtaxat*), etc. Propositions with such elements need to be explained through complex propositions, which require what we would call logical connectives such as "or" or "and." So, for example, "Only every man runs" is explained by the complex "Every man runs, and anything other than a man does not run." Of course, explainable propositions require more attention and logical skills in order to be understood, and so too their oppositions. The contradictory opposition of the above mentioned explainable proposition will have the form of a disjunction: "Not every man runs or something else other than man runs."[52] More attention and more logical skills are needed also regarding modal propositions, where a "mode" (*modus*) is logically understood as a term that qualifies the *dictum*: every modal proposition has a "modus" and a "dictum," and the *modus* puts a condition on the *dictum*: in "It is possible that Peter runs," "it is possible" or "possibly" (*possibile*) is the mode and the rest of the proposition "Peter runs" is the *dictum*.[53] Basilio Morán

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Later Medieval Philosophy. *From the Rediscovery of Aristotle to the Disintegration of Scholasticism 1100–1600*, ed. N. Kretzmann, A. Kenny and J. Pinborg, Cambridge 1982 (repr. 1997), 342-343; S. L. Uckelman, "Three 13th-Century Views of Quantified Modal Logic", in *Advances in Modal Logic – Volume 7*, ed. C. Areces and R. Goldblatt, London 2008, 389-406.

[52] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, Conferentia Sexta – De oppositione propositionum exponibilium, et modalium, [f. 43r] f. 45r: "Sit exemplum; ita est propositio exponibilis: "solus omnis homo currit", quae ita exponitur: "omnis homo currit, et aliud ab homine non currit", et sic exposita assignatur per disiunctionem contradictoria hoc modo "vel non omnis homo currit, vel aliquid aliud praeter hominem currit". Sic enim nec possunt esse simul verae, nem simul falsae. Sit aliud exemplum ista propositio: "solus Petrus est albus", ita exponitur: "Petrus est albus, et alius a Petro non est albus". Et ita assignatur eius contradictoria hoc modo, "vel Petrus non est albus, vel alius a Petro est albus." The folio is mistakenly numbered "43," since folios 43 and 44 were actually not numbered, and the counting is reintroduced with the number "43" instead of "45." This should explain the reference in brackets to the mistaken page numbering in the next quotations.

[53] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [ff. 43r-43v] ff. 45r-45v: "Praemitto secundo: in qualibet propositione modali dari modum, et dari dictum: dictum

accepts three logical modes, which are "necessary, impossible, and possible," and adds that what would count as a fourth mode, i.e. "contingent," is reducible to "what can exist."[54] Logically speaking there is a connection between propositional form (affirmation or negation) plus propositional quantity such as "omnis" and "aliquis" and modalities as properties of propositions – modalities *de dicto* –, and this seems to indicate, at this point, a fairly extensional account of modality in the sense that the mode of a given proposition amounts to the extension of the *dictum* that it determines. With an obvious didactical purpose, our author quotes two verses that should be known by heart by his audience:[55] "All [*omnis*] means [or: has the force of] *necessity*; *impossible* [means] noone [*nullus*]; *possible* [means] something, something not means *possibly not*."

Didactical concerns reach now an interesting moment. Basilio Morán wants to offer to his students an easy way of understanding and comparing, by means of oppositions, both explainable and modal propositions. This is done by our author by means of a square that keeps using the four kinds of opposition that propositions can have to one another. We are told that "necessary" finds in "impossible" a contrary opposition; "necessary" finds in "it is possible that not" a contradictory opposition; "necessary" has in "possible" a subordinate opposition; "impossible" has in "necessity" a contrary opposition; "impossible" and "it is possible" are contradictories, and "impossible" and "it is possible that not" are subordinate – finally, "it is possible" and "it is possible that not" are subcontrary. Basilio Morán is happy and proud

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appellatur illud complexum, quod modo afficitur, modus, autem, dicitur ille terminus afficiens dictum, verbi gratia in hac propositione "Petrum currere est possibile", modus est ly "possibile", "dictum" reliquum propositionis." Here, of course, "dictum" means meaningful "sentence," which, together with the modal operator, forms the modal proposition. See C. G. Normore, "Some Aspects of Ockham's Logic", in *The Cambridge Companion to Ockham*, ed. P. V. Spade, Cambridge 1999, 40-42.

[54] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [f. 43r] f. 45r: "Praemitto primo: modum logicum in commune acceptione triplicem esse nimirum: "necesse, impossibile, possibile". [...]. Quia idem est contingens, ac quod potest existere, [...]."

[55] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [f. 43v] f. 45v: "[...] quod his carminibus declaratur: Omnis *necesse* valet; *impossibile* nullus // *Possibile* quidam; quidam non *possibile non*."

to say that he takes the table[56] that illustrates the contents of his teaching – a table that can be used to "easily" (*facile*) perceive "the whole opposition of modal propositions" – from the "clear and ingenious" Doctor José de Aguilar, a Jesuit born in Peru (1652–1708), "glory and ornament"[57] of the Society of Jesus in that Province, who is taken as the designer of such a helpful scheme (Figure 3).

About this *tabula* some remarks have to be made: firstly, we should have in mind that the reference to José de Aguilar gives evidence to an interesting transmission of knowledge among Jesuits in the Spanish viceroyalties, since José de Aguilar had just published in Lima, Peru, in 1701 his complete *Cursus philosophicus*.[58] Secondly, it is a good question why Basilio Morán's square of oppositions and equivalences is stuck or attached to a tree, right at the place where "dic" – meaning "dictum," we may suppose – can be read in the graph. If *dictum* is supposed to be the meaning of a proposition or thought meaningfully expressing being – as it was expressed in Porphyrian-like trees in quite comprehensive divisions – insofar as being is in judgment, upon and after which logical entities such as the categorical proposition types

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[56] Figure 3 is found in Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [f. 44r] f. 46r.

[57] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [f. 43v] f. 45v: "Ex his facile colliges "necesse" opponi contrariae cum "impossibili", contradictoriae cum "possibili non", subalternari cum "possibili". Similiter "impossibile" opponi contrariae cum "necesse", contradictoriae cum "possibili", et subalternari cum "possibili non". Totam oppositionem propositionum modalium facile percipietis ex tabula desumpta ex docto[,] claro, et ingenioso Patre Josepho de Aguilar Peruanae Provinciae gloria, et ornamento ubi totum artificium oppositioni, et aequivalentiae propositionum modalium dilucide depinxit [...]." Among the few scholarly studies about José de Aguilar's work and thought, see W. B. Redmond, "Ser y poder ser en la metafísica de José de Aguilar", in *Ideas y valores* 51:119 (2002), 19-34; K. Bolo Romero, "José de Aguilar y la metafísica de lo posible", in *La complicada historia del pensamiento filosófico peruano, siglos XVII y XVIII (Selección de textos, notas y estudios)*, ed. J. C. Ballón Vargas, Lima, t. 2, 2011, 191-220.

[58] See Iosephus de Aguilar SJ, *Cursus philosophicus dictatus Limae*, Lima: Ex offic. Ioannis Francisci de Blas, 1701, Tomus Primus, *Summulae*, Tractatus Secundus ("De secunda mentis operatione nempe iudicio"), Sectio XI – De oppositione, et conversione modalium, 60-61.

A-E-I-O, as well as the opposed and equivalent propositions, can exist, then it makes sense, perhaps, to see in such a logical composition of tree and table something more than mere artistic freedom and visual distraction. As a further example of creativity in devising diagrams, *circa* three years before (in 1703) Nicolás de Cisneros SJ, another master of arts at the Universidad de San Gregorio, in his *Universa Aristotelis philosophia*, offered three graphs for the opposition of propositions[59] that resemble in style Castelvi's drawing of a flower of oppositions (see the previous Section). In fact, Cisneros' diagrams look like flowers of oppositions containing several layers of petals and also what can be taken perhaps as nectaries. If graphs of oppositions can be flowers, flowers fit well as elements of metaphysical trees (Figure 4A, 4B, 4C).[60]

Thirdly, the last sentences of the chapter on the opposition of explainable and modal propositions are quite enigmatic. Basilio Morán apparently affirms that José de Aguilar had drafted – he uses the verb "depingo" in the past perfect – that device (the table of oppositions and equivalences) and he "had taken for himself those words, involved by thick and dark fog, invented by Peter of Spain,"[61] namely "illiace[,] PURPUREA, EDENAVIS, AMABIMUS," although the following reading in Morán's manuscript is also allowed: "illiace[,] PURPUREA, EDENAVIS, AMAAVISNAM." Several observations are needed here: (i) in any of these readings of the manuscript, the copyist or Morán's "auditor" – Father Miguel de Medina SJ [Michael a Medina SJ] – makes a mistake by not writing "illiace" in capital letters, since that expression is part of Peter of Spain's (?) mnemonic device. (ii) If the first reading given above is right, it should be noted that it corrects

[59] Opposition of modal propositions, in Figure 4C, is found in Nicolaus de Cisneros SJ, *Universa Aristotelis philosophia* [1703], Quito, Fundación Biblioteca Ecuatoriana Aurelio Espinosa Pólit, Tractatus Primus ("De summulis"), Disputatio Tertia ("De propositione"), Sectio Tertia – De natura, oppositione, aequipollentia, et conversione propositionum modalium, f. 36v.

[60] The other two flower-like diagrams, to be seen in Figure 4A and Figure 4B, are found respectively in Nicolaus de Cisneros SJ, *Universa Aristotelis philosophia*, Quito, FBEAEP, trac. I disp. 3, Sectio Secunda – De proprietatibus propositionum, Subsectio Prima – De oppositione propositionum, f. 31v; Subsectio Secunda – Aliquae regulae ad contradictorias signandas, f. 34r.

[61] See Petrus Hispanus [Petrus Hispanus Portugalensis], *Tractatus (called afterwards Summule logicales)*, ed. De Rijk, Tractatus I ("De introductionibus"), n. 25 ("De oppositione earum [sc. propositionum modalium]"), 16.

the copyist's mistaken writing "amavimus" to the right "amabimus," which is, besides, a common error in Latin American colonial manuscripts, for the simple reason that for Spanish speaking "auditores" the spelling of "b" and "v" quite often conflate. (iii) But additionally, it is not a correct reproduction of José de Aguilar's text, if we presuppose that Basilio Morán is referring to Aguilar's *Summulae* published in 1701. In that text we do not have the expression "Edenavis," but rather "Edentuli."[62] And it is not a correct (indirect) reference to Peter of Spain's *Summulae logicales* either. At this point, a more careful explanation is needed. According to De Rijk's edition of the *Summulae logicales* by Peter of Spain, the mnemonic expressions do not appear in the oldest manuscripts, and for that reason they were referred to by the editor only in the critical apparatus. They appear in some later manuscripts indeed, in the sequence (from up-left to up-right, and then from bottom-left to bottom-right) "purpurea, ylliace, amabimus, edentuli."[63] It is not known to which edition or to which manuscript tradition of Peter of Spain's work José de Aguilar had access. At any rate, José de Aguilar is probably loyal to the sequence of words found in Peter of Spain's text or manuscripts[64].

(iv) José de Aguilar's modal square, which is reproduced by Basilio Morán, is obviously not the same as Peter of Spain's one. Peter of Spain offers each time four modal propositions that are equivalent, since he always includes a second proposition with the modal operator "contingent." José de Aguilar, as Basilio Morán after him, does not do this. After all, they assume, as actually Peter of Spain assumed too, that "contingent" *logically* converts with "possible"[65] – *metaphysically*, it

[62] See Iosephus de Aguilar SJ, *Cursus philosophicus dictatus Limae*, t. 1, *Summulae*, trac. 2, sec. 11, 60b-61a: "Et sic de aliis illas voculas calig[i]ne involutas. *Illiace, Purpurea, Edentuli, Amabimus*, a Petro Hispano inventas, mittite in tenebras exteriores, et interiores, despectus nempe, et oblivionis."

[63] So, for example, Ms. Cordoba, Archivo de la Biblioteca Capitular [*olim* Biblioteca del Cabildo], 158 (14th Century), f. 36v. Folio 36 is an addition by another hand. I am grateful to Prof. José Meirinhos, from the University of Porto, for this information and for valuable explanation about the apparatus of De Rijk's edition concerning this point of discussion. See also J. F. Meirinhos, Bibliotheca manuscripta Petri Hispani. *Os manuscritos das obras atribuídas a Pedro Hispano*, Lisboa 2011, 72-73.

[64] José de Aguilar, see footnote 62, above, reproduces the mnemonic expressions in the sequence up-right to up-left, and then bottom-right to bottom-left.

[65] Petrus Hispanus [Petrus Hispanus Portugalensis], *Tractatus (called after-*

seems to mean rather "what can be or not be."[66] In order to interpret José de Aguilar's square, we should emphasize that José de Aguilar accepts Sebastián Izquierdo's SJ (1601–1681) view that propositional equivalence regarding modes is rather "the connection of one true proposition to another," and in that sense we can always give expression to the rule according to which "[always] three propositions, pertaining to whichever class, are equivalent to each other."[67] (v) In fact, we have to address the question why did Peter of Spain and/or his followers conceive those mnemonic words? Following the explanations offered by L. Demey, the expressions "illiace, purpurea, edentuli, amabimus" will work for a diagram of oppositions between modal propositions in which we have four propositions at each corner, irrespective of the assumed conversion between "contingent" and "possible."[68] José de Aguilar and Basilio Morán, despite their diagrams with only three propositions at each corner, seemed to have acquaintance of this.[69] Clearly, each word represents a corner of the square, but we can only decipher the words by realizing that each of the four syllables of those terms stand for a modality and "each vowel stands for a combination of negations."[70] We then must be reminded that "the order of the syllables," i.e., first, second, third, and four syllable, "is significant," indicating each time a proposition that contains "possibile," "contingens," "impossibile,"

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wards Summule logicales), ed. De Rijk, trac. I, nn. 24-25, 15-16.

[66] See Iosephus de Aguilar SJ, *Cursus philosophicus dictatus Limae*, t. 1, *Summulae*, trac. 2, sec. 11, 58b-59a: "Nota ly *contingens* hic non sumi pro eo, quod potest esse vel non esse, sed prout convertitur cum *possibili*. Unde verum est dicere: *Deus [Deum?] existere, est contingens*, id est. Est possibile." For Basilio Morán's passage, see above, footnote 54.

[67] See Iosephus de Aguilar SJ, *Cursus philosophicus dictatus Limae*, t. 1, *Summulae*, trac. 2, sec. 11, 60b: "Aequivalentia [...], si sit in modo, ut optime Isquierdus, potius est connexio veritatis unius propositionis cum alia, quam aequipol[l]entia. Iam supradixi, tres propositiones ad quamcumque classem pertinentes sibi invicem aequivalere, v.g. *Petrum currere, est necesse. Ergo Petrum non currere, non est possibile. Ergo Petrum non currere, non est contingens. Ergo Petrum non currere, est impossibile*, [...]."

[68] See the talk by L. Demey, "Duality and Lexicalization in Medieval Squares of Opposition", based on joint work with H. Smessaert and D. Jaspers, in https://logicalgeometry.org/assets/pdf/Demey CLAWDWMC2017 dualitylexicalization slides.pdf, 47-48 [last visited on August 05th, 2022].

[69] See footnotes 66-67, above.

[70] Demey, "Duality and Lexicalization in Medieval Squares of Opposition", 47.

and "necesse" – the reason why vowels 1 and 2 coincide is the logical equivalence of *possibile* and *contingens*.[71] Finally, the vowels should be interpreted according to the following convention each time: "A: no negations at all; E: negation after the modality; I: negation before the modality; U: negation before and after the modality."[72] This is a fine interpretation of Peter of Spain's mnemonic terms. But of course, so understood, they do not interpret the modal square reported by Aguilar, repeated by Basilio Morán. After all, the whole explanation for those ciphers only work for the modal opposition square proposed by Peter of Spain and to which a later copyist added the enigmatic expressions. In such later manuscripts and through those ciphers the only purpose is an explanation of oppositions of a set of equivalent modal propositions at each of the four corners of the square: "Non possibile est non esse; Non contingens est non esse; Impossibile est non esse; Necesse est esse" (*Purpurea*); "Non possibile est esse; Non contingents est esse; Impossibile est esse; Necesse est non esse" (*Illiace*); "Possibile est esse; Contingens est esse; Non impossibile est esse; Non necesse est non esse" (*Amabimus*); "Possibile est non esse; Contingens est non esse; Non impossibile est non esse; Non necesse est esse" (*Edentuli*).[73] I will assume that José de Aguilar and Basilio Morán knew this modal square and were aware that the mnemonic words could only work as a didactical tool for learning those formal modal oppositions – which at any rate should be of help in learning any opposition between modal propositions. Already in 1703, Nicolás de Cisneros offered an impressive flower-like diagram in which each corner contained four (equivalent) modal propositions or equivalent propositions containing a modal operator to the *dictum* "Peter runs" – for those propositions the ciphers "Illiace, Purpurea, Edentuli, Amabimus" work perfectly.[74]

(vi) How to understand, then, the intriguing reading in Basilio Morán's manuscript, in which we find "Edenavis" instead of "Edentuli"? Logically, "Edenavis" cannot replace "Edentuli" in the modal squares discussed here. In fact, as it was admonished by José de Agui-

[71] Demey, "Duality and Lexicalization in Medieval Squares of Opposition", 48.

[72] Demey, "Duality and Lexicalization in Medieval Squares of Opposition", 48.

[73] So, for example, Ms. Cordoba, Archivo de la Biblioteca Capitular [*olim* Biblioteca del Cabildo], 158 (14th Century), f. 36v.

[74] Nicolaus de Cisneros SJ, *Universa Aristotelis philosophia*, Quito, FBEAEP, trac. I, disp. 3, sec. 3, f. 36v.

lar, those terms as a kind of cipher should be thrown towards "external and internal darkness," and this is the darkness "of contempt and also of oblivion indeed."[75] Offering a free interpretation for such a 'mistake' by Basilio Morán or his *auditor*, perhaps either author or *auditor* thought, with artistic freedom and inspired by the birds of the "Aequator," especially by the hummingbird, that a "bird of Eden" would fit well for such a goal of logical and mental purity. Moreover, if artistic freedom inspired the phrase "Purpurea, Edenavis, AmaAvisNam," does it allow a translation, a kind of devotion to the bird that extracts honey from logical flowers? In fact, on the right side of the diagram, hanging on a branch of the three (see Figure 3), a bird can be found indeed, although, sadly enough, it was drawn without colors in the manuscript by Hyacinto Basilio Morán.

3. Faustino Páez and the *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* (1738)

A next chapter in this research about the theory of proposition and the theory of opposition, including the study of didactical tools that were devised to illustrate the teaching of logic and perhaps also discoveries in logic, is found in the *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* by the Jesuit Faustino Páez, finished in November 1738.[76] Comparing the manuscripts that were conferred and partially described for this study, we can affirm that no author makes such a frequent use of diagrams as does Faustino Páez. His *Summulae* contain a treatise "on opposition, conversion, and equivalence of simple absolute propositions," whose first section is "The definition and the division of logical opposition."[77] Páez's definition of opposition

[75] Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus*, *Tractatus primus summularum sive summulae praeceptorum dialecticae*, disp. 3, conf. 6, [f. 43v] f. 45v: "[...], desumptis illis voculis, caligine involutis, illiace[,] PURPUREA, EDENAVIS, AMABIMUS [AMAAVISNAM?], a Petro Hispano inventis, quasque ut ipse Aguilar admonet, mittite in tenebras exteriores, et interiores, despectus nempe et oblivionis. Haec est tabula." See also footnote 57, above.

[76] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, Fundación Biblioteca Ecuatoriana Aurelio Espinosa Pólit.

[77] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logi-*

depends on Aristotle's *De interpretatione*.[78] Aristotle had understood opposition as there being "affirmation and negation of the same about the same," but the force of this logical opposition or the opposition between two propositions relies on a "metaphysical principle," which is here something like a principle of non-opposition: "it is impossible that the same at the same time is and is not." This principle of being instructs the human intellect about the fact that affirming and negating the same of the same at the same time cannot possibly be connected to truth – it can only be connected to falsity.[79] This is then Páez's definition of the logical opposition: "the simultaneous unverifiability [*simultanea inverificabilitas*] of two propositions, one that affirms, another that denies the same of the same."[80] In fact, Faustino Páez repeats the motto that logical opposition is generally taken as four in number, where contradictory opposition is both "simultaneous unverifiability and [simultaneous] unfalsifiability" of two compared propositions – one that affirms and another that denies the same of the same. That two contradictory propositions cannot be true or false at the same time means that, if one is true, the other is false, and vice versa; after all, in contradictions a true or a false proposition only and precisely affirms or denies, formally and respectively, what suffices to

cam introductio, Quito, FBEAEP, Tractatus Secundus ("De oppositione, conversione, et aequipol[l]entia propositionum absolutarum simplicium"), Sectio Prima – Oppositionis logicae definitio, et divisio, pp. 96-101.

[78] See Aristoteles, *Hermeneutik oder vom sprachlichen Ausdruck*, hrsg. v. Zekl, 6 17a25-35, 102-105.

[79] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. II, sec. 1, n. 142, pp. 96-97: "Non agimus de oppositione physica, qua nimirum qualitates contrariae, vel duae propositiones contradictoriae pugnant quoad idem subiectum, sed de oppositione logica, quam ita definire possit, Aristoteles lib. 1 *De interpretatione*, cap. 2 [6?], dicens "esse affirmationem, et negationem eiusdem de eodem". Tota vis oppositionis logicae nectitur ex illo principio metaphysico, "quodlibet est, vel non est", quod [a]equivalet huic, "impossibile est idem simul esse, et non esse", aut huic "impossibile est, idem simul neque esse, neque non esse"; haec enim principia, quae lumine naturae nota sunt, satis instruunt intellectum, ut cognoscat, quod nequit cum veritate de eodem subiecto idem simul affirmare, et negare."

[80] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. II, sec. 1, n. 142, p. 97: "Et hinc logica oppositio oritur, quae sic potest definire: simultanea inverificabilitas duarum propositionum alterius affirmantis, et alterius negantis idem de eodem."

falsify the other.[81] In difference to that, contrary propositions are such that one proposition either denies more or affirms more than what is necessary to falsify the other.[82] Moving now to Faustino Páez's explorations of more complex kinds of opposition, we should say that he surprises his readers with non-standard squares of opposition, such as a specific diagram for the oppositions of singular propositions. Páez believes that the non-modal singular proposition "Peter runs" needs, for the understanding of its relative property "opposition," the use of modal singular propositions.[83] It is interesting to remember that, in 1706, Basilio Morán – see the previous Section – had affirmed that, for some authors, Aristotle's teaching of oppositions provided no analysis of singular contradictory propositions. Faustino Páez, other than what Basilio Morán did, provided a specific square for that kind of opposition (Figure 5).

Later in the manuscript, by means of complex (or molecular) propositions composed by two different singular (and simple) propositions, that is, of propositions whose logical form depends on connectives such as "and" ("copulative" propositions), "or" ("disjunctive" propositions), and "not" (negation), Faustino Páez repeats the use of a diagram of oppositions to expose complex oppositions – such as the contradictory propositions "Peter runs and Paul talks" and "Either Peter does

[81] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. II, sec. 1, n. 144, pp. 97-98: "Oppositio logica quadruplex communiter esse dicitur nimirum contradictoria[,] contraria, subcontraria, et subalterna. Contradictoria est simultanea inverificabilitas, et infalsificabilitas ex vi formae duarum enuntiationum alterius affirmantis, et alterius negantis idem de eodem. Propositiones contradictoriae nequunt esse simultanea verae, neque simul falsae; sed si una vera est, altera falsa debet esse, et e contra. Et ratio est quia propositiones contradictoriae ita opponuntur ut negativa solum neget id, quod sufficit, et requiritur ad falsificandam affirmativam, et affirmativa solum affirmat, quod sufficit ad falsificandam negativam; unde neque simul verae; neque simul falsae esse possunt. Rationeque formae, vel dispositionis terminorum inverificabiles, et simul infalsificabiles esse debent, modo quo explicuimus. Ideo contradictoriae non sunt haec: "omnes homo est animal; nullus homo est animal", quia licet simul verae, nec falsae esse possint id habent, id habent ratione materiae, non ratione formae: plus enim negat secunda propositio, quam requiritur ad falsitatem primae."

[82] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. II, sec. 1, n. 145, p. 98.

[83] Figure 5 can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. II, sec. 1, n. 148, p. 101.

not run or Paul does not talk." In fact, we are tempted to think that through such diagrams Páez is making a step in the direction of formalizing complex propositions.[84] At any rate, such a procedure of opposing complex propositions that make use of logical connectives could be understood perhaps as a mixture of Stoic or Chrysippian[85] and Aristotelian logic. Generally speaking, the study of truth-functional relations of logical connectives had a significant place in medieval logic too, and it was especially connected to the analysis of "implication" related to the so-called theory of "consequences."[86] In fact, diagrams should be used to facilitate understanding and memorizing logical properties of propositions, more exactly, what is well established or what is safely known about logical properties and linguistic particles that convey their meaning. If there is a theoretical discussion about a given issue in logic, it is rather carried discursively. So, for example, Páez mentions a discussion about how to attribute a contradiction to a copulative proposition composed of two simple and contradictory propositions, say, "Peter runs and Peter does not run." Some authors follow the rule according to which "in order to contradict there is nothing better than to prefix to every proposition a negation." The contradictory opposition to the above mentioned proposition would then be "It is not the case that Peter runs and Peter does not run" – the negation of the copulative contradiction –, which amounts to the proper disjunction "Either Peter runs or Peter does not run." On the other hand, other authors affirm that such contradiction cannot have a contradictory opposition, since it is not possible to assign it a logically contrary proposition – that would be "Neither Peter runs nor Peter does not run," but this is logically

[84] Figure 6 can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, Tractatus Tertius ("De propositionibus compositis, et modalibus"), Sectio Prima – De propositionibus contradictoriis formaliter compositis, n. 159, p. 110.

[85] On the Stoic advances in the logic of connectives, see, for example, B. Mates, *Lógica elementar*, trans. L. H. B. Hegenberg and O. S. da Mota, São Paulo 1968, 266-171; Kneale e M. Kneale, *O desenvolvimento da lógica*, trans. Lourenço, 115-180; F. H. Sandbach, *The Stoics*, Bristol ²1989, 95-100.

[86] See, for example, Moody, *Truth and Consequence in Mediaeval Philosophy*, 64-100; E. A. Moody, "The Medieval Contribution to Logic", in *Studies in Medieval Philosophy, Science, and Logic. Collected Papers 1933–1969*, Berkeley-Los Angeles-London 1975, 377-380. See also G. Klima, "Consequence", in *The Cambridge Companion to Medieval Logic*, ed. C. D. Novaes and S. Read, Cambridge 2016, 327-332.

equivalent to "Peter runs and Peter does not run," since the contrariety is translatable as "Peter does not run and Peter runs." And propositions opposed as contrary propositions cannot be equipollent.[87]

Moreover, presupposing again that every proposition has opposition as one of its relative properties, we are allowed to say that *exponibiles* must have four kinds of opposition as well. We find, thus, a diagram for "explainable propositions" in Faustino Paéz's *Summulae*, that is, a single diagram for explainable propositions and their oppositions, where at each of the four corners of the diagram we have the explainable proposition and its "explanation" (*expositio*) and then, at a different corner, we have either its contradictory, its contrary, its subcontrary or its subordinate proposition. So, for example, "Only every man talks" is explained as "Every man talks and nothing other than man talks,"[88] and the contrary opposed propositions of both the explainable and the explained proposition are, respectively, "Only every man does not talk" and "No man talks and everything other than man talks."[89] We should note, moreover, that it is not quite appropriate to talk about "tables" or "squares" of oppositions in Paéz's several diagrams, for it is obvious that – just like Nicolás Cisneros before him – Paéz prefers concentric round-like or even flower-like graphs, in which the four corners are

[87] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 1, n. 160, pp. 110 [111]: "Hic rogari solet num possit assignari contradictoria propositioni copulativae constanti duplici contradictoria, verbi gratia "Petrus currit, et non currit"? Alii affirmant, quia cuilibet propositioni contradictur praefigendo particulam "non" iuxta illud, "non est melius contradicere, quam toti propositioni negationem praefigere". Contradictoria ergo illius iuxta hanc opinionem erit haec propositio "non Petrus currit, et non currit", quae [h] abebit hunc sensum disiunctivae propriae, "vel Petrus currit, vel non currit". Negant alii posse assignari contradictoriam, quia praedictae propositioni non potest assignari propositio logice contraria: haec namque "neque Petrus currit neque non currit" aequipollens primae; repugnat autem propositiones contrarias esse aequipollentes. Pro solvendo nodo hoc gordiano plurima a recentioribus excogitata fuere; qui tamen melius superiorum gladio disruptus fuit."

[88] An explanation that confirms, of course, that explainable propositions are "virtually composite" propositions.

[89] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, Sectio Secunda – De aliquibus propositionibus exponibilibus, vel virtualiter compositis, nn. 161-162, pp. 110 [111-112]. The correct counting of pages is inside the brackets. In the manuscript, "110" is used three times in the sequence, as page number.

somehow comparable to the four petals of a flower and the flower core or the flower ovary is somehow the "dic" or the "dictum" upon which, through reflection, the intellect conceives all kinds of oppositions, equivalences, and conversions between propositions (Figure 6 and 7).

It is obvious that Páez considers diagrams a useful tool[90] to understand and fixate established knowledge of oppositions and equivalences. Equivalences and oppositions seem to have the additional function of explaining the logical role that the several linguistic particles – at specific parts of the proposition – should play in order to determine the logical properties of propositions but, due to linguistic confusion, this is not always clear. If there is, thus, a table explaining and opposing "exclusive particles" used in parts of the proposition such as "just" and "only up to this extent" (characterizing, therefore, "exclusive propositions"[91]), there is also a diagram clarifying, through equivalences and oppositions, "exceptive particles"[92] such as "but" or "other than" (*praeter*) – characterizing, therefore, "exceptive propositions," which follow this definition: "An exceptive proposition is the one in which the predicate is enunciated of the common subject excepting some inferior [item or object] which is included in the subject, such as, for example, "Every man but Peter studies," in which Peter is excepted and the study is affirmed of all remaining [men]."[93] So, for example,

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[90] With regard to the learning process of the opposition between exclusive propositions, Páez considers "verses" (*carmina*) useful too; see Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec, 2, n. 162. p. 110 [112]: "Tantum, et non tantum contradictoria: necnon // Tantum non; non tantum non. Contraria sunt // Tantum, et tantum non."

[91] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 2, n. 161, p. 110 [111]: "Propositio exclusiva est, quae constat particula aliqua excludente, verbi gratia "tantum, dumtaxat, etc." Figure 7 can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 2, p. 110 [112].

[92] Which, in Latin, can sometimes work as "extensive" particles in "extensive propositions" as well; an example is the particle "praeter," which is, respectively, exceptive and extensive in the following two propositions: "Omnis homo praeter Petrum studet" and "Petrus praeter Paulum studet." Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 2, n. 163, p. 111 [113]. See Kretzmann, "*Syncategoremata*, *exponibilia*, *sophismata*", 218-240.

[93] Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 2, n. 163, p. 111 [113]: "Propositio exceptiva est, in qua praedicatum enuntiatur de subiecto communi excipiendo aliquod

"Every man but [*praeter*] Peter is a musician," which means "Every man other than Peter is a musician and Peter is not a musician," is contradicted by "Not every man but [*praeter*] Peter is a musician," which means "Either some man other than Peter is a musician or Peter is a musician."[94] For similar reasons, Páez offers to his students a table for "reduplicative propositions" or propositions containing "reduplicative particles," such as "prout" or "inquantum."[95] We finally find in Faustino Páez's Third Treatise of the *Summulae* a square of oppositions for modal propositions – for universal, particular, and singular propositions containing "necessary," "possible," and "impossible" as modal notes or operators. There, terms for quantity or extension such as "all" and "some," connected to the form of the proposition in terms of *affirmation* and *negation*, are used to logically understand, through oppositions, the meaning of all modal operators in propositions (Figure 8A, 8B, 8C).[96]

Concluding Remarks

In this brief study, it is not possible to try to compare the originality of some of our authors' theories about proposition, opposition and diagrams of opposition and explanation with the accounts offered by medieval authors and even with the attempts provided by authors of their own times – above all other Early-Modern and Modern Latin American and Iberian scholastic thinkers. This is future work. What can already be concluded is that summulistic logic in the Americas, during the so-

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inferius, quod in subiecto includeretur verbi gratia "omnis homo praeter Petrum studet", in qua Petrus excipitur, et de reliquis affirmatur studium."

[94] Figure 8A can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, sec. 2. p. 112 [114].

[95] In fact, "exclusive," "exceptive," "extensive," "reduplicative," "causal," and "conditional," propositions count among those which are taken as "explainable" or "virtually composite" propositions. Figure 8B can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, Sectio Tertia – De reliquis propositionibus exponibilibus vel virtualiter compositis, n. 167, p. 114 [116].

[96] Figure 8C can be found in Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio*, Quito, FBEAEP, trac. III, Sectio Quarta – De propositione modali, n. 170, p. 116 [118].

called colonial times, may be a stimulating field to learn about logical concepts and quite a disputed field with regard to theories, methodological approaches and teaching tools as well. *Tabulae* and diagrams of oppositions, equivalences, and explanations were a living tradition in South American colonial universities, and their interpretation requires a closer look at the discursive expositions behind them. In fact, one can argue that the logical ideas supposed to be embodied by such graphic devices have no dependency upon them. That is probably true. But can such diagrams help to not only somehow understand accepted theses, but also grasp new theses not clearly stated or discursively expressed? With regard to the sample of manuscripts analyzed, visually what used to be called "tables" to describe those graphs is, in many cases, not quite appropriate. Although the basic structure of four round or squared corners with opposed items plus the explicit square and the internal cross connecting the corners remains, the new flora and fauna of the New World seem to have inspired richer representations. That much is clear. But do those richer representations relate somehow to a different understanding of propositional opposition first or better expressed by the representation itself? Of course, this study makes a risky attempt to say that this is perhaps the case. If we can find a square of oppositions hanging on or even fixed on a tree, we also find diagrams that have only round or circular forms together with what looks like flower petals. These petals always touch the core or ovary of the flower-like structure, and usually four clear petals connect the corners of the graph as they represent the crossing lines of contradictions of the traditional square. Around and behind the core/ovary, petals can appear in several layers, even the corners look like flower petals, where all parts of the graph seem to flow dynamically from the core. In the core of the flower-like figure, we always find the "dic" written in the middle of "contra*dic*toriae." It is arguably also an abbreviation of "dictum." After all, contradiction is opposition *rigorose et proprie* or *stricto sensu*, and because it presupposes the same *dictum*, all other oppositions – through reduction to contradiction or through inclusion in the subordinating proposition – are oppositions as long as they oppose presupposing the same *dictum* expressed by a proposition – indefinite or singular – such as "S is P." Moreover, theoretically at least, the study of opposition does not begin with the assumption of A-E-I-O canonical proposition types, but rather with propositions as vessels expressing meaning. Because and as long as this meaning can be logically determined, propositions oppose. Less

controversially, and summarizing what has been studied so far, we can affirm that corners of diagrams have in some cases, as an explanation of modal proposition oppositions, four propositions each time. In the diagrams that were analyzed, each corner has up to twelve oppositions each time. The use of such visual resources to understand and learn oppositions was widespread. They indicate a concern both for teaching tools and a simpler, at the end also a more formal, way of controlling difficulties intrinsic to natural language variance. At any rate, in the case of our perceptual tools at least, everything has to be further explained, both what we say and what we see.

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Fig. 1: Ignatius Gil Castelvi SJ, T*ractatus in universam Aristotelis dialecticam, amplectens physicam, et metaphysicam ad unum corpus redactus* [1665], Quito, FBEAEP, Tractatus artis dialecticae, disp. 4, c. 3, f. 15r.

Fig. 2: Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus, Tractatus primus summularum sive summulae praeceptorum dialecticae* [1706], Quito, ANE, disp. 3, conf. 3, f. 41r. 2

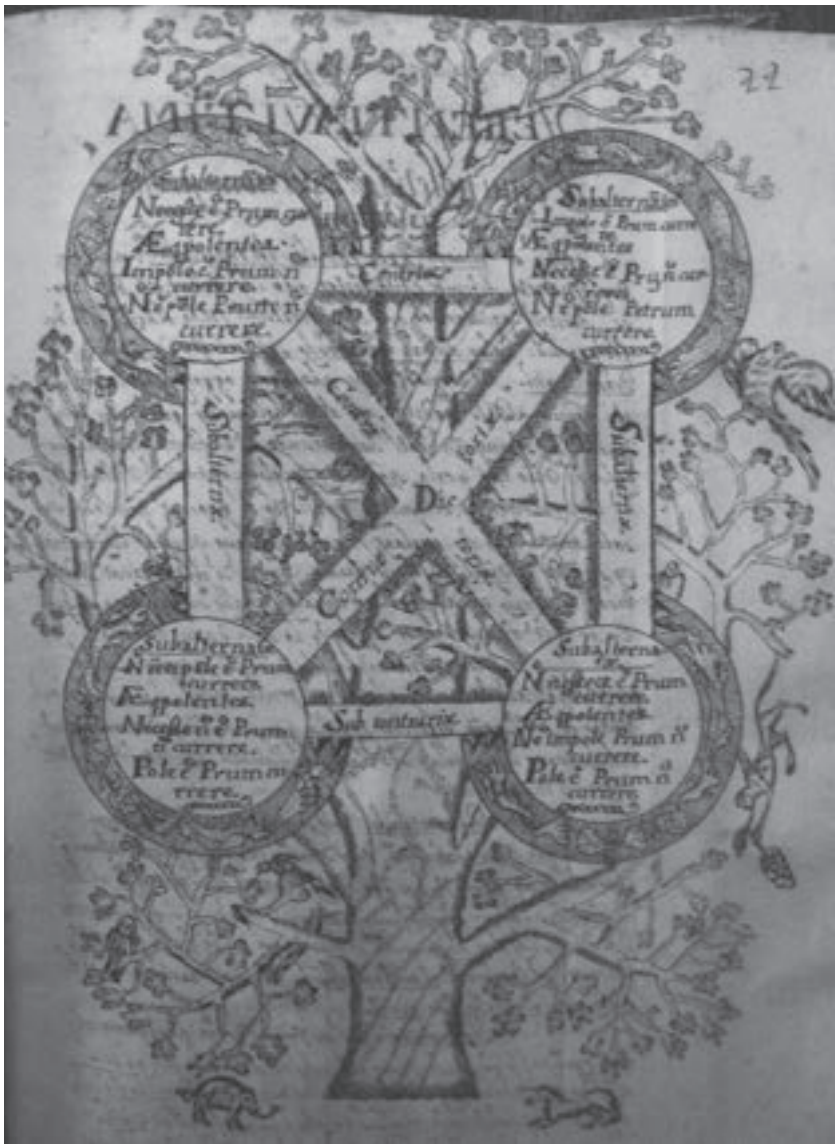

Fig. 3: Hyacintus Bacilius Moran SJ, *Cursus philosophicus triennalis in Logicam[,] Physicam, et Metaphysicam Aristotelis tripartitus, Tractatus primus summularum sive summulae praeceptorum dialecticae* [1706], Quito, AHN, disp. 3, conf. 6, [f. 44r] f. 46r.3

Fig. 4A: *Nicolaus de Cisneros SJ, Universa Aristotelis philosophia* [1703], Quito, FBEAEP, trac. I disp. 3, sec. 2, subsec. 1, f. 31v.

Fig. 4B: Nicolaus de Cisneros SJ, *Universa Aristotelis philosophia* [1706], Quito, FBEAEP, trac. I disp. 3, sec. 2, subsec. 2, f. 34rc

Fig.4C: Nicolaus de Cisneros SJ, *Universa Aristotelis philosophia* [1703], Quito, FBEAEP, trac. I, disp. 3, sec. 3, f. 36v.

Fig. 5: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. II, sec. 1, n. 148, p. 101.

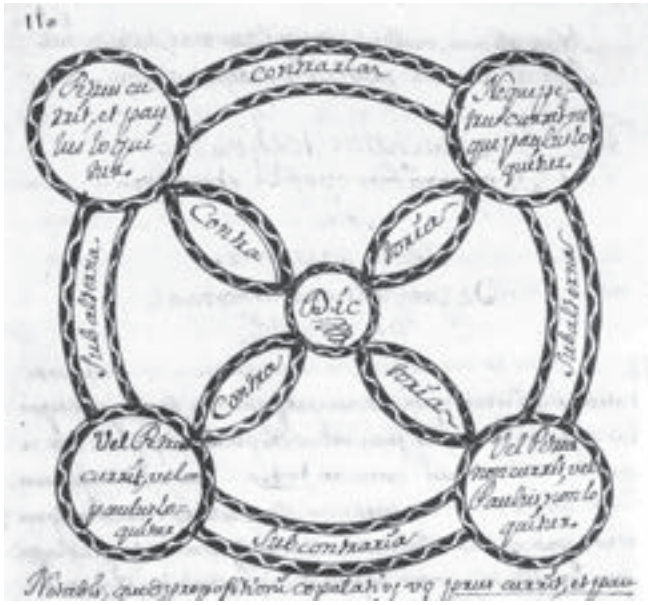

Fig. 6: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. III, sec. 1, n. 159, p. 110.

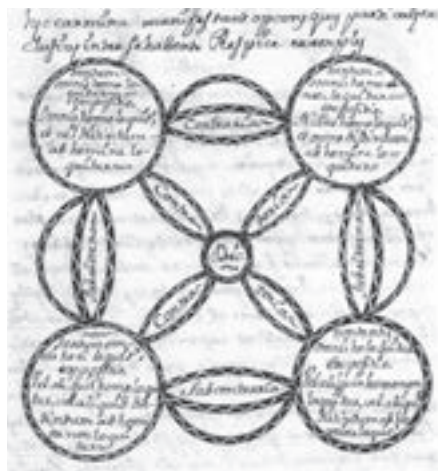

Fig. 7: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. III, sec. 2, p. 110 [112].

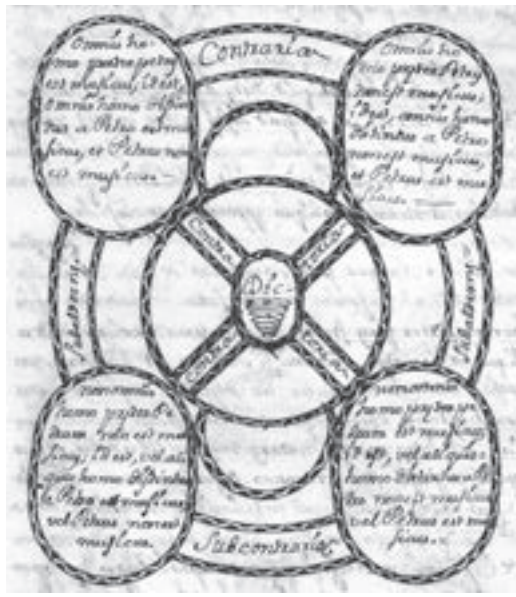

Fig. 8A: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. III, sec. 2, p. 112 [114].

Fig. 8B: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. III, sec. 3, n. 167, p. 114

[116].

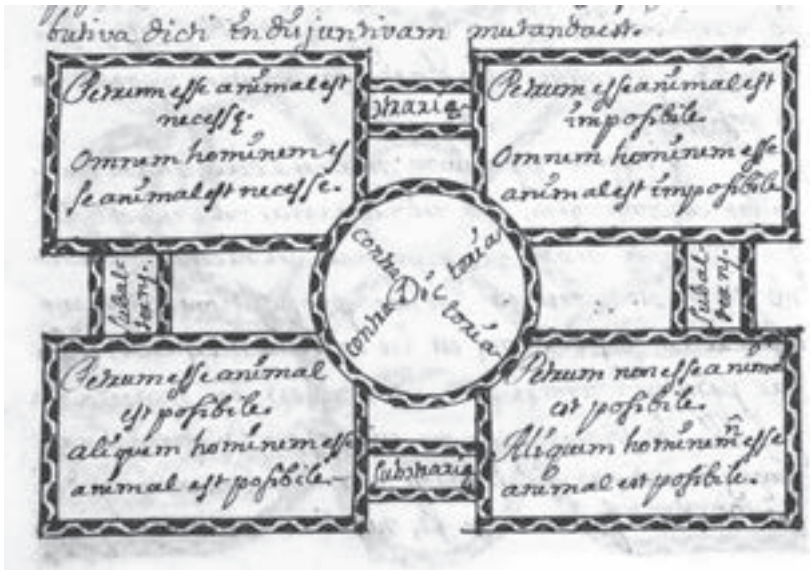
Verum esse animal est necessę.
Omnem hominem esse animal est necesse.
Verum esse animal est impossibile.
Omnem hominem esse animal est impossibile
Verum esse animal est possibile.
aliquem hominem esse animal est possibile.
Verum non esse animal est possibile.
Aliquem hominem esse animal est possibile.

Fig. 8C: Faustinus Paez SJ, *Summulae sive brevis ad magnam Aristotelis Stagiritae logicam introductio* [1738], Quito, FBEAEP, trac. III, sec. 4, n. 170, p. 116 [118].

Ordo and Nature
The Trees of Sculpted Narrative at Orvieto Cathedral

Pippa Salonius

This paper examines natural order and mirroring in the medieval program of sculpted reliefs at Orvieto cathedral, where biblical episodes are organized into a framework of four majestic trees (Fig. 1). These *arbores* present the Bible in images, abbreviated to a series of exemplary episodes. Flanking the entrance portals on the cathedral façade, they were accessible to everyone in Orvieto. The program was a two-pronged teaching tool. At one level it presented the Bible in pictures. At another, deeper, level it provided a framework of biblical truths for individuals to freely use as prompts, actively forging their own lines of connection and exercising their own judgment, while contemplating their own history and relationship with God.[1] This paper explores how the medieval audience might have read this sophisticated visual system and the textual authorities that informed its design. Arboreal diagrams flourished in scholastic thought processes and I will connect the Orvieto example to knowledge of Aristotle's works and Franciscan teaching at the university of Paris, which, I believe, played a seminal role, informing the project.[2]

Lorenzo Maitani and his workshop sculpted the relief program on the pilasters at Orvieto cathedral between 1310 and 1330.[3] The Tree of

[1] A. Minnis, *Medieval Theory of Authorship: Scholastic Literary Attitudes in the Later Middle Ages,* London 1984, 201-202.

[2] P. Salonius and A. Worm, "Introduction", in *The Tree. Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought,* ed. P. Salonius and A. Worm, Turnhout 2014, 1-9; A. Even-Ezra, *Lines of Thought: Branching Diagrams and the Medieval Mind,* Chicago 2020.

[3] According to Renato Bonelli, Maitani was called to Orvieto *c.*1308. A document of 1310 records him presenting work already executed and a plan for future works on the cathedral, among them the façade, already known from his preparatory drawing, although work on it had not yet commenced. He died in June 1330. R. Bonelli,

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Jesse, however, is already shown in its current position in a late thirteenth-century preparatory drawing for the façade, which suggests the design of the façade reliefs was well formulated before construction began.[4] The extensive sculpted program is organized into an arboreal framework that combines figurative scenes set in medallions and rectangular frames (Fig. 2.). Similar to medieval encyclopaedic texts, it aimed at providing a concise compilation of human knowledge and guided knowledge acquisition through careful classification (*divisio*) and organisation (*ordo*) of its parts.[5] Its design, coincides with and po-

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Il Duomo di Orvieto e l'Architettura del Duecento Trecento, Perugia 2003, 65; L. Fumi, *Il Duomo di Orvieto e i suoi restauri,* a cura di L. Riccetti, Orvieto 2002, 348, 353, 371.

[4] J. White, "The Reliefs on the Façade of the Duomo at Orvieto", in *Journal of the Warburg and Courtauld Institutes* 22, 3/4 (1959), 23. The plan probably emerged with the presence of major stonemasons at the site. While documentation of the thirteenth century building site is rare, records from 1293 show the construction of a *loggia* for stone masons and payment of their wages, as well as payments to renowned sculptors: Fra Guglielmo da Pisa (order of preachers), who worked on the Arca di San Domenico in Bologna and Ramo da Paganello da Siena, one of the best stonecutters and sculptors of his day. Fumi, *Il Duomo di Orvieto*, 442, 891. The plan appears to be the earliest of two surviving preparatory façade drawings. On it, the central elevation of the façade, flanked by two narrow gables on the aisles, fits coherently with the original basilica plan of the cathedral. A second drawing, with raised elevations and double gables over the side doors, shows greater correspondence with the building as it stands today and is probably Maitani's. Neither drawing is dated, but they were likely done in or after 1290 when cathedral foundations were laid. The earliest plan almost certainly predates the crisis of *c.*1308, which provoked massive structural changes to the building, and was when Maitani was summoned. Bonelli, 155-161, 219; E. Carli, *Le Sculture del Duomo di Orvieto,* Bergamo 1947, 16. For a timeline of the cathedral works, with a brief discussion of the major documents, see: C. Vincenza Manfredi, "Cronologia critica del duomo di Orvieto (1280-2019)", in *Studi sull'Architettura del Duomo di Orvieto,* a cura di P. Cimbali Spagnesi, Roma 2020, 217-285.

[5] For the multiple medieval meanings of the Latin term *ordo,* see: M. D. Chenu, *Nature, Man and Society in the Twelfth Century,* ed. J. Taylor and L. K. Little, Chicago 1968, 80-81. The term 'encyclopedia' stands in place for medieval terms such as *speculum* (mirror) and *summa* (comprehensive treatise). Medieval 'encyclopedias' were not referred to by this term, which humanists coined from Greek *enkuklios paedeia* (the circle of learning) in the fifteenth century. M. W. Twomey, "Inventing the Encylopedia", in *Schooling and Society: The Ordering and Reordering of Knowledge in the Western Middle Ages,* ed. A. MacDonald and M. W. Twomey Leuven 2004, 74; B. Ribémont, "On the Definition of an Encyclopaedic Genre in the Middle Ages", in *Pre-Modern Encyclopaedic Texts: Proceedings of the Second COMERS Congress, Groningen, 1-4 July 1996,* ed. P. Binkley, Leiden 1997, 47-61.

sibly responds to rising demand from lay patrons for direct access to encyclopaedic texts via vernacular translations.[6]

As a basic didactic tool, the program proceeds chronologically from left to right across the pilasters. The vertical columns of information read upwards in accordance with the natural process of growth inherent to their arboreal frames. Within these, the sequence of biblical episodes runs from left to right along the horizontal axis in the first three trees, with time eternal shown on the last tree. In its general appearance, the layout resembles the open pages of an illustrated medieval Bible (Fig. 3). On a par with medieval texts, pictorial content is spatially divided into blocks of knowledge (Fig. 2). However, unlike in an illuminated manuscript – closed to a wider community of viewers – content at Orvieto was on public display where it could prompt memory, contemplation and growth in all individuals from all levels of society. In line with Alain de Lille's definition of preaching, it provided "an open and public instruction in faith and behaviour, whose purpose is forming humankind."[7] Trees fill the surface of the four pilasters, forming a complex and interconnecting network, a natural environment for the human activity they frame. Expansive growth is conveyed by the flourishing arboreal grid. Vegetation and human figures are caught in a state of flux, portrayed as active participants in God's unfolding plan.[8]

The variety of trees and their fruit leaves no doubt they reference the garden of Eden (*Ez.,* 47, 12). Reading from left to right espaliered ivy frames stories from Genesis on the first pilaster, volutes of acanthus order the Tree of Jesse and a third tree illustrating the Life of Christ and, on the final pilaster, the Last Judgement is defined with grape vine (Fig. 2). While these plant species do not fit the modern

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[6] J. Le Goff, "Pourquoi le XIIIe siècle a-t-il été plus particulièrement un siècle d'encyclopédisme?", in *L'enciclopedismo medievale,* a cura di M. Picone, Ravenna 1994, 23-39.

[7] "Praedicatio est manifesta et publica instructio morum et fidei, informationi homium deserviens, ex rationum semita et auctoritatum fonte proveniens", Alainus de Lille, *Ars praedicandi,* "praefatio", PL 210, 111C; I use Pietro Delcorno's English translation: P. Delcorno, "Late Medieval Preaching", in *Oxford Bibliographies Online,* https://www.oxfordbibliographies.com/view/document/obo-9780195396584/obo-9780195396584-0239.xml (accessed 24/01/22).

[8] E. Keen, "Shifting Horizons: The medieval compilation of knowledge as mirror of a changing world", in *Encyclopaedism from Antiquity to the Renaissance,* ed. J. König and G. Woolf, Cambridge 2013, 277-300, 299.

definition of a tree, both ivy and grape vine clearly came under the category in the middle ages, when the Dominican friar Albertus Magnus described them in Book 6 *De arboribus* (On the Trees) of his treatise *De vegetabilibus libri VII* (1256-57).[9] Tree motifs in "acanthus, along with humans and a variety of real and imagined animals," on the other hand, were common in Roman religions and Christianity, where they symbolized death and renewal in nature or immortality of the soul.[10] In Orvieto, there was a performative element to reading the trees. Caught in the branching network of Biblical narrative, the audience became active participants in the Christian reality it presented. There could be no doubt they were being treated to a glimpse of paradise, for in delighting in this sculpted garden of scripture, viewers were physically required to turn their eyes and bodies eastwards towards Eden, in the direction – marked by God and nature – of the rising sun.

The trees in Orvieto have multiple levels of meaning. Carved from stone, the living frame of the tree speaks through the real and suggested substance of its materiality. Sourced from natural surroundings, the stone it was carved from "speaks of the permanent, the monumental" while the tree it portrays "in contrast, is a growing mutating thing: to a greater extent than stone it is immanent".[11] And so the message conveyed by these materials combines a reassuring sense of permanence and stability with the promise of new growth and therefore change.[12] The meaning conveyed by the stone trees at Orvieto rings true to their liminal purpose. As the substance from which the church is made, this

[9] "(Hedera helix Lin.) Edera est arbor…"; "(Vitis vinifera Lin.) Vitis est arbor…". Albertus Magnus, *De vegetabilibus libri VII,* ed. E. Meyer and C. Jessen, Berlin 1867, 385, 358. For the date of *De vegetabilibus*, see: G. Wöllmer, "Albert the Great and His Botany", in *A Companion to Albert the Great,* ed. I.M. Resnick (Brill's Companions to the Christian tradition 38), Leiden 2013, 221-268, 226.

[10] J. D. Archibald, *Aristotle's Ladder, Darwin's Tree: The Evolution of Visual Metaphors for Biological Order,* New York 2014, 43.

[11] P. Binski, "The Rhetorical Culture of Gothic Sculpture. Sophus Bugge Annual Lecture 2017", in *Collegium Medievale* (2017), 17.

[12] While such concepts appear conflicting and confuse the modern mind, for medieval Christians time was a construct. They were used to the shifting temporalities of medieval Roman liturgical practices, which were "always depicted against the more static backdrop of an assumed eternity". M. Fassler, "The Liturgical Framework of Time and the Representation of History", in *Representing History, 900-1300: Art, Music, History,* ed. R.A. Maxwell, University Park, Pennsylvania 2010, 151.

wall of nature and knowledge (that of the cathedral façade) stands at the limit of the terrestrial world (that which is never still, outside the church) and the space and time of God (or eternity, inside the church).[13] In content, form and material the programme on the pilasters of the cathedral façade might therefore be seen to express Saint Augustine's belief that God exists in eternity, perceived as "for ever still [*semper stans*]" in contrast to things that are "never still."[14]

The façade programme also represents the book of the Bible, in its content, form and materiality. In a biblical reading the two trees to the left of the central portal reference the Old Testament and those on the right, the New Testament (Fig. 2). The narrative on the first pilaster moves through the stories of creation, the Fall of Man and the first generations of humanity, to terminate with Cain's descendants, whose performance of technical and intellectual activities illustrate humanity striving for redemption after the Fall.[15] On the highest register male ancestors represent the liberal arts of Grammar, Music and Geometry. As the base of the medieval university curriculum, the liberal arts consisted of the verbal disciplines of grammar, logic and rhetoric, taught in the *trivium* and four mathematical disciplines: arithmetic, geometry, astronomy and music, which were taught in the *quadrivium*.[16] Reading from left to right across the pilaster in Orvieto, Grammar is singled out to represent the *trivium* while Geometry represents the *quadrivium* on the far right. They are conjoined through Music, which, though

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[13] This argument owes much, not least its sources, to Anna-Maria Moubayed's polysemic reading of the West Façade of Saint-Martin-de-Besse. A. M. Moubayed, "A Polysemic Interpretation of the West Façade of Saint-Martin-de-Besse: Time, Space, and Chiasmus Carved in Stone", in *Religions* 13.2 (2022) https://www.mdpi.com/2077-1444/13/2/152 (accessed 14/09/22). In the *City of God* Saint Augustine presents time as "neither lineal or cyclical, but both […]. There are places where time will be unraveled and where structures will be open-ended". See S. J. Gould, *Time's Arrow, Time's Cycle: Myth and Metaphor in the discovery of Geological Time,* Cambridge 1988, 10-11.

[14] "Augustine refines his notion of eternity one last time. Eternity is 'for ever still [*semper stans*]' in contrast to things that are 'never still'." In the façade program at Orvieto the stone ground is "forever still" but the living wood of its frame and its figurative content is "never still", P. Ricoeur, *Time and Narrative,* ed. K. McLaughlin and D. Pellauer, 2 vols, Chicago 1984, I, 25.

[15] Carli, *Le Sculture del Duomo*, 42-46.

[16] J. Cadden, "The Organization of Knowledge: Disciplines and Practices", in *The Cambridge History of Science, Vol. 2 Medieval Science,* ed. D. C. Lindberg and M. H. Shank, Cambridge 2013, 240-267.

taught as a mathematical discipline, was also a literature of self-contained and transmittable musical works and could therefore be understood as a verbal discipline.[17] Male embodiments of the liberal arts "are exceptional and flout both iconographic convention and the gender of the Latin nouns."[18] Breaking with tradition, at Orvieto the arts are no longer shown as abstract female personifications, but rather – closer to the contemporary reality of medieval universities where they were taught – depicted as male exponents of them.[19]

In accordance with the preliminary drawing of the façade, the second pilaster is sculpted with a *Tree of Jesse* (Fig. 2). The image references the Old Testament prophecy of Christ's incarnation (*Is*., 11, 1-3). This sculpted version of it is the only example of this extensive iconographic type in western Europe, but corresponds with a number of trees found in wall paintings throughout the Balkan peninsula (13th-18th centuries).[20] Set within spiralling rinceaux of acanthus that shoot from a tight cluster of basal leaves rooted at Jesse's side, Christ's royal lineage is outlined along the central axis of intertwining stems.[21] In this extend-

[17] R. Strohm, "Introduction", in *Music as a Concept and Practice in the Late Middle Ages,* ed. R. Strohm and B. J. Blackburn, Oxford 2001, xxvii-xxviii; R. Strohm, "The Humanist Idea of a Common Revival of the Arts and its Implications for Music History", in *Interdisciplinary Studies in Musicology, Report from the Third Interdisciplinary Conference, Posnań,* 1996*,* ed. M. Jablonski and J. Steszewski, Poznań 1997, 7-25.

[18] M. Evans, "Allegorical Women and Practical Men: The iconography of the *Artes* Reconsidered", in *Medieval Women,* ed. D. Baker and R. M. T. Hill, Oxford 1978, 305.

[19] L. Cleaver, "The Liberal Arts in Sculpture and Metalwork in Twelfth-century France and Ideals of Education", in *Immediations* 4 (2007), 57-75.

[20] For eastern models: P. Salonius, "*Arbor Jesse – Lignum vitae:* The Tree of Jesse, the Tree of Life, and the Mendicants in Late Medieval Orvieto", in *The Tree. Symbol, Allegory, and Mnemonic Device in Medieval Art and Thought,* ed. P. Salonius and A. Worm, Turnhout 2014, 213-242; For the correct identity of the scene of the prophecy of Micah: J. M. O'Brien, *Micah: Wisdom Commentary,* Collegeville 2015, 63-64. For the western origins of the historiated Tree of Jesse: M. Castiñeiras, "Sabia, reina y profetisa: la fortuna de la Sibila en Bizancio", in *Respondámosle a Concierto. Estudios en homenaje a Maricarmen Gómez Muntané*, ed. E. Carrero and S. Zauner, Barcelona 2020, 99-116; M. D. Taylor, "A Historiated Tree of Jesse", in *Dumbarton Oaks Papers,* 34-35 (1980-1981), 127, M. D. Taylor, "The Prophetic Scenes in the Tree of Jesse at Orvieto", in *The Art Bulletin,* 54 (1972), 403-417.

[21] The acanthus roots that extend to Jesse's side at Orvieto are unusual. R. J. Adams, "Isaiah or Jacob? The Iconographic Question on the Coronation Portals of Senlis, Chartres, and Reims", in *Gesta* 23 (1984), n. 28.

ed version the kings are flanked by Jacob's twelve sons, the founding members of the twelve tribes of Israel. Narrative scenes representing Old Testament prophesies of Christ's arrival fill the surrounding medallions. They are accompanied by their sources the prophets, who stand in pairs carrying blank scrolls at the outer edges of the medallions. At the extreme limits of the tree, twelve men are shown transmitting knowledge of the prophecies to future generations, who kneel before them.[22] Together with Christ's regal ancestors and Jacob's sons, these 24 figures make up the total number of Christ's human ancestors according to the gospel of Saint Matthew.[23] At the base of the tree, twelve pagan philosophers and a sibyl are arranged on two levels beside Jesse. Like the prophets above them the scrolls they hold are blank. They are shown in movement, apparently discussing, debating or expounding on the scenes above in a manner that evokes contemporary scholastic ideas and activities.[24] Among them Socrates is recognizable, characterized by his physiognomy known through classical sculpture. Above him Plato is portrayed according to Eastern models, where a sarcophagus representing the legend of his tomb was associated with a prophecy of the incarnation.[25] Despite the rejection of western models – at the cathedrals of Chartres and Sens male figures of pagan philosophers were included in sculpted cycles of the liberal arts – designers felt no need to provide viewers with any identifying inscriptions at Orvieto.[26] Was knowledge of Byzantine iconography more widespread, particularly in centres of papal occupancy like Orvieto, than previously suspected?[27]

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[22] Carli, *Le Sculture del Duomo*, 32. Taylor claims these figures are teaching apostles. Taylor, "Historiated Tree of Jesse", 126.

[23] A. Nava, "L'albero di Jesse nella cattedrale d'Orvieto e la pittura bizantina", in *Rivista dell'Istituto dell'archeologia e storia dell'arte,* 5 (1936), 366.

[24] Cleaver, "The Liberal Arts", 58.

[25] Plato appears as one of seven sages of Antiquity who predicted the incarnation, according to early Christian writers. While it had no pictorial tradition in the West, surviving Byzantine examples include a damaged fresco of the Tree of Jesse in the narthex of Bogorodica Ljevîska at Prizren (1310-1313). D. Knipp, "Medieval Visual Images of Plato", in *The Platonic Tradition in the Middle Ages,* ed. S. Gersh and M. J. F. M. Hoenen, Berlin 2002, 373-416.

[26] Knipp, "Images of Plato", 389. Associating the arts with philosophers, who where their earliest students, promoted these cathedrals as sites where knowledge of the past was preserved and taught; Cleaver, "The Liberal Arts", 62.

[27] Knipp, "Images of Plato", 395.

The iconography of the New Testament trees to the right of the entrance portal is less surprising. The acanthus foliage frame of the third tree mirrors that of the Tree of Jesse across the main entrance (Fig. 2). Its scenes are organized into eight tiers of roundels that depict New Testament scenes from the life of Christ, from the Annunciation to the *Noli me tangere* episode. Eleven men in 'antique dress' read or expound on the scrolls they hold in their hands. They are arranged on two levels around a reclining figure who mirrors Jesse at the base of the Old Testament tree. His identity will be discussed shortly. Summed with the seven figures holding scrolls along the trunk of the tree, the number in total corresponds to the eighteen prophetic books of the Vulgate Bible, which they personify.[28] Surrounded by flourishing vegetation these sources of knowledge already occupy a world reassuringly graced by the presence of the messiah. The pervasive presence of prophets in the central trees on the façade at Orvieto suggests alignment with Franciscan thought stemming from Bonaventure, for whom prophecy was crucial and who "advocated a position where certain approaches to reading scripture could predict the future."[29] At the outer limits of the New Testament tree angels observe Christ's earthly life unfold. According to Bonaventure not only humanity, but also the angels were reconciled with God through Christ.[30] Arms crossed at the chest, the angels mirror submission to the crucified Christ in a gesture that must have been familiar to a good number of the cosmopolitan medieval viewers at Orvieto, as it was adopted by the priest after consecration of the mass.[31] With arms crossed over the chest or hands

[28] Carli, *Le Sculture del Duomo*, 38.

[29] E.A. Constant, *Concepts of Prophecy in the Middle Ages: Inspired Exegesis, Visions from God and the Interactions of Theories and Practice*, Unpublished doctoral thesis: Michigan State University 2016, 99-100. In a broader reading of prophecy in the middle ages, Richard Southern claims it "filled the world-picture, past, present and future; and it was the chief inspiration of all historical thinking. R.W. Southern, "Presidential Address: Aspects of the European Tradition of Historical Writing: 3. History as Prophecy", in *Transactions of the Royal Historical Society* 22 (1972), 159-180, at 160.

[30] "[…] for through the Word made flesh the fall of both humankind and the angels is repaired, of both those in heaven and on earth." Bonaventura, *Breviloquium* IV, 3.4, ed. D. Monti (Bonaventure Texts in Translation Series 9), New York 2005, 141. L. Togni, "The Hierarchical Center in the Thought of Bonaventure", in *Franciscan Studies* 76 (2018), 137-158.

[31] Medieval rubrics prescribe the gesture after consecration of the mass during the *Supplices te rogamus* prayer: *"Tunc cancellatis brachiis in modum cruces, inclinet se*

clasped in prayer, their gestures illustrate the means – through human prayer and Christ's sacriface –, by which salvation might be obtained.

This third tree furnishes examples for an apostolic life and so informs human decision-making in the present, the consequences of which determines entrance to the eternal world, shown on the fourth and final pilaster in a tree that frames the Last Judgement. Formed from a well-tended vine bearing grapes, this tree references the space of the church beyond the façade where the mass takes place and the city's miraculous relic of the Eucharistic is housed.[32] Unlike the sequential narrative of separate worldly events in the previous three trees, this tree presents time universal. Its branches establish a hierarchy of ascendance towards grace according to medieval iconographic and literary traditions.[33] On the left side of the fourth tier, recently deceased architect Lorenzo Maitani (d. 1330) takes his place alongside bishops, a pope and thirteenth-century mendicant saints Francis and Dominic in a surprisingly inclusive display of the elect.[34] The gathering is indicative of Orvietan society in the second half of the thirteenth century when the city was a favoured residence for popes and their retinues.[35]

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devote Sacerdos ad Altare, dicendo." E. Wilberding, "Embracing the Cross: A Liturgical Gesture", in *Source: Notes in the History of Art* 8 (1989), 1-5.

[32] Eucharistic relics of the corporal and bleeding host from the mass in Bolsena (1263-1264) were probably held in a simple container in the cathedral until they were transferred to a sumptuous reliquary resembling the cathedral façade, signed and dated by the Sienese goldsmith Ugolino di Vieri in 1338. D. Rigaux, "Miracle, reliques et images dans la chapelle du Corporal à Orvieto (1357-1364)", in *Pratiques de l'eucharistie dans les églises d'orient et d'occident (antiquité et moyen âge),* ed. N. Bériou, B. Caseau, D. Rigaux, Paris 2009, 234-241; G. Freni, "The Reliquary of the Holy Corporal in the Cathedral of Orvieto: Patronage and Politics", in *Art, Politics, and Civic Religion in Central Italy : 1261-1352 : Essays by Postgraduate Students at the Courtauld Institute of Art,* ed. J. Cannon and B. Williamson, Aldershot 2000, 117-177.

[33] Carli, *Le Sculture del Duomo*, 46.

[34] The speculative-scientific exegesis of scripture – made visual in Orvieto – was identified with revelation by Bonaventure, who believed anyone lacking in humility to be incapable of receiving knowledge of it. J. Ratzinger, *The Theology of History in St. Bonaventure,* ed. Z. Hayes, Chicago 1989, 69-71.

[35] For Orvieto as a city of papal residence and the connection these figures have with Orvieto, see: P. Salonius, "The Cathedral Façade: Papal Politics and Religious Propaganda in Medieval Orvieto", in *Visible Exports/Imports. New Research on Medieval and Renaissance European Art and Culture,* ed. E. Anderson, J. Farquhar and J.

In terms of social hierarchy and temporal proximity, heaven was shown well within grasp of its medieval Orvietan audience.

The arboreal narrative allows seepage between the categories of temporal progression past, present and future. The first and second trees reference the past by illustrating the history of humanity and its saviour (Fig. 2). At the same time innovative representations of the liberal arts among their branches suggest life in the present and prophets hint at future possibilities. In the third tree exemplary episodes from the life of Christ urge viewers to seriously consider their own actions; past, present and future. While the fourth and final tree presents future possibilities as a consequence of these actions and references recently deceased figures still fresh in living memory.[36] Thus, a comprehensive reading of the trees required viewers to move through *memoria* (memory)*, contuitus* (observation) and *expectatio* (expectation) in "a pattern that corresponds vaguely to the movement of Augustine's thought in the *Confessions:* from direct experience back to the supporting memories and forward to the outreach of hope and confidence in God's provident grace."[37]

Shown repeatedly along the central axis of the façade, Christ is the key to salvation (Fig. 1). He represents the point of transition between the Old and New Testaments. Through him connections are made. He is the perfect image, which humanity can but hope to mirror. The whole of two parts, the product of disparate ideas, he guides knowledge and indeed his image dominates the central axis of the façade: as the Christ

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Richards, Newcastle upon Tyne 2012, 125-144; P. Salonius, *Orvieto and its Cathedral: The City, the Curia and its Context* (unpublished doctoral thesis), University of Warwick 2007, 68-70.

[36] Mixing dimensions of time in a way true to Augustine: "The particular way in which Augustine's model, which grows out of liturgical practice, mixes the dimensions of time results in two major differences in how medievals and moderns have contemplated history […] According to this model, time is not either linear or cyclical, but both, and various units move in various ways – forward, backward, some simultaneously, some synchronized, some neither." Fassler, "The Liturgical Framework of Time", 150.

[37] Augustine divides time into a time present of things past, a time present of things present and a time present of things future and claims they coexist in the soul. Augustinus, *Confessions and Enchiridion*, ed. and trans. A. C. Outler (Library of Christian classics 7), London 1955, XI, 20, note 437, https://www.ling.upenn.edu/courses/hum100/augustinconf.pdf (accessed 13/09/22).

child in the tympanum over the entrance, as the Lamb of God above the lower gable, as the holy face at the centre of the rose window and in the mosaics that filled the high central gable.[38] The message is clear: although Eden was lost through original sin, the earthly garden can still be transformed through the coming of Christ, who as the second Adam restored God's order (*Rev.* 2, 7). Indeed, it is 'through the figure of Christ' that a more expansive reading of the program can be achieved. This involves looking across the Old and New Testament trees in search of corresponding patterns and signs, as one references text and image across a book opening or sees reflections in a mirror (Fig. 2).[39] Searching for 'parallelisms' across the central figure of Christ, the viewer actively seeks correspondences through similarity or contrast in the trees and is then forced to make an imaginative leap to create meaning.[40] Aby Warburg called this "the iconology of the space

[38] The Virgin and Child Enthroned over the central portal dates to 1325-1330 when Maitani directed the cathedral works. *La cattedrale di Orvieto Santa Maria Assunta in Cielo,* ed. G. Testa, Roma 1990, 141-151. Prevailing opinion attributes the rose window to Andrea di Cione (l'Orcagna), although another argument attributes it an earlier moment when Andrea Pisano was *capomaestro*. Manfredi, 238-241; R. Bartalini, *Scultura gotica in Toscana. Maestri, monumenti, cantieri del Due e Trecento*, Milano 2005, 355. The bronze Lamb of God was caste by Matteo d'Ugolino da Bologna in 1352. Carli, *Le sculture del Duomo*, 50. The Coronation of the Virgin drawn in on the central tympanum in the original façade plan was exchanged for a mosaic of the Resurrection. This was evidently executed maladroitly by Francesco di Rinaldo Siciliano (in Orvieto 1506-1522) and replaced later with the existing iconography. C. Harding, "The Production of Medieval Mosaics: The Orvieto Evidence", *Dumbarton Oaks Papers,* 43 (1989), 73-102. For images, see: https://it.wikipedia.org/wiki/Duomo di Orvieto#/media/File:Rosone del Duomo di Orvieto.JPG (Accessed 22/06/2022).

[39] In the *Breviloquium* (*c.*1257) Bonaventure writes all the perceptible world was created as a book in which the wisdom of the creator was revealed. To perceive the *vestigii* (divine traces), *imago* (image) and *similitude* (similitude) of God was the way for humanity to climb the ladder of contemplation and return to him. T. J. Johnson, *The Soul in Ascent: Bonaventure on Poverty, Prayer and Union with God*, New York 2012, 31-32. Around the same time Humbert of Romans fourth master of the Dominicans (1254-1263) uses the same analogy of creation as a book in his treatise *On the Formation of Preachers.* In it he connects wisdom with the natural process of growth, reminding future preachers there were many kinds of knowledge: "God poured out his wisdom over all his works, and this is why those who know how to read this book will draw from it many things which are very serviceable for helping people to grow." R. French and A. Cunningham, *Before Science: The Invention of the Friars' Natural Philosophy,* New York 2016, 202.

[40] Deleuze and Guattari call this "semiotic translation." C. Cambre, "Neither Visible

between": where, rather than trying to capture the significance of an image, meaning comes from the 'diverse, layered and multidirectional relationships accrued between images."[41] In his seminal exploration of the *shape* of scriptural passages, John Breck explains that feelings of suffering or the transmission of divine promises were often expressed through poetic forms involving symmetry that produced 'parallelisms' among several elements of a literary unit.[42] Bonaventure was evidently well aware of this type of reading and he explains it through scripture:

> Thus, Sacred Scripture, given to us by the Holy Spirit, takes up the book of creation, making it relate to its own end through a threefold manner of understanding. The tropological meaning lets us know what we should resolutely do; the allegorical meaning, what we should truly believe; the anagogical meaning, what we should desire for our eternal delight.[43]

Breck claims it is impossible to read the psalms or prophetic oracles without "sensing the harmonious repetition that occurs between successive lines" and Justin Shaun Coyle's work on the taxic shape and theological aesthetics of the Trinity in the *Summa Halensis* leads me to believe Bonaventure came to value this spatial expression of knowledge, at least in part, through his "master and father" Alexander of Hales.[44]

Not all the poetic correspondences that take form in the visual programme at Orvieto are evident. Having to work to discover them is what makes the heuristic process effective. While medieval viewers were well-versed in the language of signs and consciously looking beneath

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nor Hidden: The Structuring of the Sensible", in *Invisibility in Visual and Material Culture,* ed. A. Grønstad and Ø. Vågnes, London 2019, 137; G. Deleuze and F. Guattari, *A Thousand Plateaus*, London 2013, 129-172.

[41] Cambre, "Neither Visible", 134; P.A. Michaud, *Aby Warburg and the Image in Motion,* trans. Sophie Hawkes, New York 2004, 42.

[42] The pattern, known as *"parallelismus membrorum,"* was perfected by ancient Hebrew writers and carries over to the New Testament. It was a powerful way to convey the author's meaning. Breck explains "the *shape* of a biblical passage plays a substantial role in conveying its message." J. Breck, *The Shape of Biblical Language: Chiasmus in the Scriptures and Beyond,* New York 1994, 1-2.

[43] In the Prologue of Bonaventure's *Breviloquium,* "On the Depth of Holy Scripture", no. 5; Bonaventura, *Breviloquium*, Prologus, IV 5, ed. Monti, 16.

[44] J. S. Coyle, "Beauty among the *Transcendentals* in the *Summa Halensis*", in *Nova et Vetera,* English ed. 18 (2020), 1-33.

the surface for layers of meaning, not everyone at Orvieto was prepared in the knowledge production process and so paths were signalled for them through the trees.[45] Reading across the vertical axis, medallions on the *Tree of Jesse* loosely mirror the arboreal shape of scenes devoted to Christ on the *New Testament* tree (Fig. 2). The acanthus foliage frame – common to both trees –, also suggests they should be read relationally. The familiar scene showing prophecy and fulfilment of the crucifixion in corresponding medallions (second tier down on the right) on both trees indicates a typological reading of their scenes. While the mirror images of reclining figures at their base suggest a figuring forth of their narrative content and fulfilment across the Old and New Testaments.[46]

We can be sure Christ's progenitor Jesse lies at the base of the Old Testament tree, but the identity of the figure mirroring him in the New Testament tree remains ambiguous. In his seminal study of the Tree of Jesse, Arthur Watson points to the possibility of "a medieval placing in parallel of Jesse and Jacob."[47] Indeed this occurs in an illuminated manuscript at the Cathedral of Trier (Fig. 4) and in the trees of Jesse and Jacob sculpted on the doorjambs flanking the Portal of the Virgin on the Baptistery of Parma.[48] As symbols of the Virgin, the iconography of Jacob's Ladder and the Tree of Jesse is appropriate in Orvieto where the cathedral is dedicated to the Assumption of the Virgin.[49] But while Jacob's primary role in the New Testament is that of the ancestor of Christ (Matthew 1: 2-16, Luke 3: 34-36), cross-referencing of this type seems uncharacteristically garbled, given the presence of Jacob's sons in one tree and the angelic protagonists of his dream sitting passively in the other. Moreover, in Orvieto no visual evidence suggests the ladder of Jacob's dream or angels ascending or descending it.[50]

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[45] "If one is to advance through the forest of Sacred Scripture …" Bonaventura, *Breviloquium*, Prologue VI, 4, ed. Monti, 21.

[46] For Edward Nolan, "mirroring and typology are inseparable". E. P. Nolan, *Now through a Glass Darkly. Specular Images of Being and Knowing from Virgil to Chaucer*, Ann Arbour 1990, 18, 302, note 5.

[47] A. Watson, *The Early Iconography of the Tree of Jesse*, Oxford 1934, 51-53.

[48] The Parma portal was signed and dated in 1196 by Benedetto Antelami. D. Glass, "The Sculpture at the Baptistery at Parma: Context and Meaning", in *Mitteilungen des Kunsthistorischen Institutes in Florenz* 57 (2015), 255-291

[49] Adams, "Isaiah or Jacob?", 124.

[50] Carli, *Le Sculture del Duomo*, 38.

An alternative reading recognizes Christ's legal and corporeal descent traced through King David and Abraham in the Gospels of Luke and Matthew. Through David, illustrated in the Tree of Jesse, Christ has the right to the throne and through Abraham, he was the Messiah. Recognizing Abraham in the figure that counterbalances Jesse at the base of the New Testament Tree establishes Christ as both King and Saviour. A third possibility is that the reclining figure is Adam, the first man, in which case the tree above him "recovers and combines in a single system the knowledge Adam lost."[51] Although humankind lost Eden through original sin, the arboreal programme leads the eye through this earthly garden on the boundary of eternity, alive with the promise of how it might be transformed and ordered through the word made flesh, that is Christ, who is the second Adam.[52] Framing scenes of Christ's passion, the third tree is an image of the living cross, which according to popular medieval legend was made from the wood of the Tree of Life, raised at Adam's burial site for Christ's crucifixion.[53] The trees in Orvieto juxtapose their content and invite comparison. Their image and the images within them were intentionally equivocal. They were to be read both in their separate parts and as a whole, and they were open to interpretation. Paul Ricouer claimed, "figurative tropes have the characteristic of being free" and that freedom seems to have been consciously afforded to the audience at Orvieto.[54] Seeing through a mirror was a murky business in the Middle Ages. Consequently, the identity of the figure mirroring Jesse across the church entrance is not clear-cut, but polyvalent, bringing to mind Jacob, Abraham and/or Adam.[55]

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[51] A. Middeldorf Kosegarten, *Die Domfassade in Orvieto. Studien zur Architektur und Skulptur 1290-1330*, Munich-Berlin 1996, 54; R. W. Southern, *Scholastic Humanism and the Unification of Europe* 1995, 11.

[52] "The second Adam restores God's order according to Revelation 2:7." Moubayed, "A Polysemic Interpretation", 36, 49.

[53] Salonius, "Tree of Life", 294-295.

[54] P. Ricoeur, *Memory, History, Forgetting,* trans. K. Blamey and D. Pellauer, Chicago 2004, 95.

[55] A thirteenth-century French version of the wood of the cross legend known as the *Bible Anonyme* specifies both Adam and Abraham sat under the same tree, that was once the Tree of Life and would become the instrument of Christ's death. L. C. Campbell, "'Mervoillous fu li engineres que croix fist de fust, non de pierre': Materiality and Vernacular Theology in the Wood of the Cross Legend", in *The Surrounding Forest. Structuring Knowledge with Trees at the Time of the Middle Ages*, ed. M. D. J.

The arboreal frames of scenes from Genesis and the Last Judgement mirror each other across the central axis. Although formed from diverse plant species, the ivy and grape vines spiral up to frame rectangular vignettes in a similar manner on the external pilasters. Further from the central axis and quite distinct from the acanthus medallions on the two central trees, the connection between them is limited to the frame, which seems to indicate a completed cycle; that the narrative has come a full circle. Contemplating the pattern of flourishing foliage across the central axis of Christ and the church entrance at Orvieto, the chiastic narrative structure of the pictorial narrative on the pilasters becomes clear (Fig. 2).[56] A chiasmus or chiasm is a rhetorical device that places two corresponding elements (words, phrases or grammatical structures) in the middle of an antithetically balanced clause: AB:BA.[57] It was used to focus the reader's attention on the central idea or turning point of a unit. The crosswise placement of elements takes its name from the Greek letter *chi,* which was a symbol of Christ in the Middle Ages. Chiastic structures occur frequently in the Old and New Testaments, where they organize text, cue the reader to central ideas and facilitate their memorization.[58] Their unique shape – "based on inverted parallelism but involving a concentric, spiralling flow as well – provides a hermeneutic key that is indispensable for a proper interpretation of the biblical writings."[59] At Orvieto the ancient rhetorical device employs arboreal imagery to give "shape" to scripture and bring the central figure of Christ over the entrance to the church to the attention of its audience.

In Orvieto scripture is supplied in images not words, yet its sources, the images it builds on in our minds, are drawn from pictures and

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Bintley and P. Salonius (Nature and the Environment in the Middle Ages series), Woodbridge (forthcoming).

[56] See Anna-Maria Moubayed's convincing argument on the use of chiastic patterns at the church of Saint-Martin-de-Besse. Moubayed, "A Polysemic Interpretation", 37-42.

[57] Commonly defined as an inverted parallelism, an example is: Beauty is truth / truth, beauty. Breck, *The Shape of Biblical Language*, 2; V. Hannon Smitherman, "Chiasm", in: *Encyclopedia of Ancient Greek Language and Linguistics,* ed. G.K. Giannakis, http://dx.doi.org/10.1163/2214-448X eagll SIM 00000425 (accessed: 27/02/22).

[58] Breck, *The Shape of Biblical Language*, 21, 29.

[59] Breck, *The Shape of Biblical Language*, 2.

words.[60] The Orvieto reliefs both illustrate and – in their structure, they represent the Bible. Just as they illustrate ideas drawn from encyclopaedic texts and, in their complexity, variety and organisation, they represent encyclopaedic texts. Not surprisingly, the rediscovered repertoire of Aristotle's writings also lurks behind the images.[61] Aristotle opens his discussion of the soul by connecting knowledge with beauty and it is fitting that the sculpted discourse at Orvieto should so elegantly and beautifully address the salvation of the soul.[62] In his philosophy, the term 'nature' is designated an 'order' in that it strived for perfection in its determined forms and its laws, just as the natural imagery at Orvieto orders ideas and guides humans to make judgements and attain perfection in God's grace.[63] Aristotelian theory centres on the theme of representation of a thing formally learned or acquired and places the problematic of the image within that of remembering.[64] "The soul never thinks without a mental image," according to Aristotle and indeed the sculpted program uses material images to facilitate memory recall and imagination in its readers (that is: observation in the present leads to knowledge of the past and of the future).[65] Regardless of its tangibility however, the image carries meaning through all stages of knowledge recollection and production. Aristotelian thought also gives structure to the knowledge presented at Orvieto. The four pilasters of imagery express the doctrine of four causes, which Aristotle "provides as an exhaustive and precise classification of the things responsible for the existence of another thing, and by the naming of them the thing can be completely accounted for" (Figs. 1 and 2).[66] In such a reading, scenes from Genesis show the substance out of which humanity came to be and persist (*causa materialis*). The narrative flows into images of the shape into which humanity is

[60] Ricoeur states that the return of a memory can only take place in the mode of becoming-an-image (and there is a constant danger of confusing remembering with imagining because of this). Ricoeur, *Memory,* 5-55.

[61] Z. Hayes, "History, Metaphysics and Theology in Bonaventure", in *Words Made of Flesh: Essays Honoring Keenan B. Osborne,* ed. J. Chinnici, New York 2011, 73-83.

[62] "We regard all knowledge as beautiful and valuable …" Aristoteles, *On the Soul, Parva Naturalia, On Breath,* ed. W.S. Hett, LCL 288, Cambridge, MA 1957, 8-9.

[63] Chenu, *Nature, Man and Society*, 81n.

[64] Ricoeur, *Memory,* 7.

[65] Aristotle, *On the Soul,* 176-177.

[66] See 'Forward' by Arthur Leslie Peck (11 July 1952), in Aristotle, *Parts of Animals,* ed. A.L. Peck and E.S. Forster, Loeb Classical Library 323, Cambridge 1937, 25.

changed, with the essential characteristic manifest in the process of becoming in the Tree of Jesse (*causa formalis*). In the third tree Christ is shown as the catalyst by which change is brought about (*causa efficiens*) and the final tree of Judgement shows the purpose or goal for which that change is brought about (*causa finalis*).[67]

The thirteenth century saw the phenomenal rise of the mendicant orders throughout Europe, who, "with papal support, used Aristotelian ideas to develop their philosophies of nature."[68] At the University of Paris, the Franciscans distinguished themselves from the Dominicans arguing that prayer was not just a passive response to divine mandate, but rather an active process through which the theological virtues were practiced.[69] By meditating on the Book of Creation, humanity practiced the theological virtues in prayer and drew closer to God. Among the Franciscans, Saint Bonaventure stands out as a likely influence on the design program at Orvieto: for his scholastic preparation and teaching at the university of Paris, his use of images of nature to structure his teaching and his personal connection with Orvieto. Recent scholarship on Bonaventure also credits his theory of knowledge to Aristotle's influence.[70] This is not to say he accepted all Aristotelian thought. His criticism of Aristotle's denial of divine ideas is registered in Orvieto where God's idea of Eve is represented among Genesis episodes.[71]

Bonaventure was born within a day's ride of Orvieto in Bagnoregio. He knew the Franciscan convent in Orvieto and gave at least two public lectures in the city when he was minister general of the Fran-

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[67] H. Müller-Merbach, "How to Structure Knowledge: Aristotle and the Four Causes", in *Knowledge Management and Practice* 3 (2005), 183-184.

[68] Keen, "Shifting Horizons", 292.

[69] Johnson, *The Soul in Ascent*, 9.

[70] W. Peterson Boring, "Revising our approach to Augustinian Illumination: A Reconsideration of Bonaventure's *Quaestiones disputatae de scientia Christi IV,* Aquinas' *Summa theologiae* 1a.84, 1-8, Henry of Ghent's *Summa quaestionum ordinarium,* Q.2, art. 1 and 2", in *Franciscan Studies,* 68 (2010), 39-81.

[71] Supported by an angel, Eve is foreshown behind God as he creates the animals on the sixth day. L.A. Smit, "Jesus Christ as the exemplar of magnaminity: Magnaminity in Bonaventure's *Collationes in Hexaemeron*", in *Ordo et Sanctitas: The Franciscan Spiritual Journey in Theology and Hagiography. Essays in Honor of J.A. Wayne Hellmann,* ed. M. Cusato, S. McMichael, T. Johnson, Leiden 2017, 229-248.

ciscans in 1262 and 1264.[72] These lectures postdate the *Breviloquium* (*c.*1257), given at the culmination of his Parisian academic career, the *Itinerarium mentis Deum* (The Mind's Journey to God, 1259), the work he introduces with images of the mirror and the seraph that combined, form the text's organizing symbol, and the *Lignum vitae* (Tree of Life, 1257-1267), all of which no doubt informed his teaching. Bonaventure structures his teaching spatially – he builds a frame with his words and teaches through it.[73] Already in the prologue of his *Commentary on the Sentences* (1250-1252) Bonaventure explains that unlike other fields of knowledge, scripture unfolds by supernatural inspiration for the sake of providing Man the wayfarer with as much knowledge as he needs to save his soul.[74] Using language that is sometimes literal, sometimes figurative, scripture sums the content of the entire universe, covering the whole course of history in its *breadth*, displaying the glory of those to be saved in its *length*; recounting the misery of the reprobate; and in its *height*, thus revealing the *depth* of the universe and God's judgement. Bonaventure's spatial metaphor has an important precedent in the third verse of Francis's undated *Expositio in Pater Noster* (A Prayer Inspired by the Our Father), in which the founder responds to his brothers' request to teach them how to pray.[75]

> *Holy be Your Name:*
> May knowledge of You become clearer in us
> that we may know
> the *breadth* of Your blessings,
> the *length* of Your promises,
> the *height* of Your majesty,

[72] Salonius, "Cathedral Façade", 126.

[73] "The detail and *depth* of Bonaventure's organization are essential to understanding the text" (emphasis mine). C.A. Levri, "A Structural Analysis of Bonaventure's *Omnium artifex docuit me sapientia*", in *Franciscan Studies* 76 (2018), 67-97 (75).

[74] Bonaventura, *Commentaries on the First Book of Sentences,* trans. Alexis Bugnolo, Mansfield 2014, 12-14; 487.

[75] For architectural expression of Bonaventure's four dimensions, see: E. Gustafson, "The *Perscrutator* in the Hidden Depths of Franciscan Architectural Space", in *Aesthetic theology in the Franciscan tradition,* ed. X.J. Seubert, O.V. Bychkov, New York 2020, 154-155.

the *depth* of Your judgements.

Francis of Assisi.[76]

In Bonaventure's treatise *Lignum vitae* readers are instructed to 'picture in their minds a tree with twelve branches', each marking different periods of Christ's life and bearing his virtues in its twelve fruits. Proceeding chronologically and anagogically, readers work through exemplary episodes of Christ's life to understand his virtues. In this manner they can ascend the cross with Christ in order to look upon his face in heaven.[77] One of the earliest monumental images of this treatise is painted on the wall of the parish church of San Giovenale in Orvieto and dates roughly to the time work began on the sculpted relief program on the city cathedral.[78] Bonaventure's thought had evidently gained traction outside Franciscan circles in early fourteenth-century Orvieto.

The discovery of Bonaventure's inaugural sermon at the University of Paris *Omnium artifex docuit me sapientia* (Wisdom, artisan of all things, taught me) shows him employing the imagery of natural growth to organize his thoughts as early as 1254.[79] The sermon, delivered in two parts, first presents a study of scripture according to Aristotle's four causes and secondly divides the canon of the arts and returns it to God through scripture.[80] It is governed, both in its parts and as a whole, by a reoccurring pattern of *ortus-modus-fructus*.[81] Bonaventure uses these three terms, or near identical ones, both to describe the structure of scripture and indicate the way its study should be approached.[82]

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[76] *Francis of Assisi: Early Documents,* ed. R.J. Armstrong, J.A. Wayne Hellmann, W.J. Short, New York 1999, 158.

[77] Salonius, "Tree of Life", 318.

[78] The painting is attributed to the beginning of the fourteenth century (1300-1320). Salonius, "Arbor Jesse", 213. For images, see: https://www.artfaithhistory.org/lalbero-della-vita-or-the-tree-of-life (accessed: 16/09/22).

[79] J.C. Benson, "Bonaventure's Inaugural Sermon at Paris: *Omnium artifex docuit me sapientia.* Introduction and Text", in *Collectanea Franciscana,* 82 (2012) 517-562.

[80] Levri, "A Structural Analysis", 67, 69.

[81] J.A. Wayne Hellmann, *Divine and Created Order in Bonaventure's Theology,* trans. J.M. Hammond, New York 2001, 484.

[82] J.C. Benson, "The Christology of the *Breviloquium*", in *A Companion to Bonaventure,* ed. J. Hammond, W. Hellmann, J. Goff (Brill's companions to the Christian tradition 48), Leiden 2014, 247-287 (253-254).

The pattern, described in terms of flourishing upward-rising growth, structures a number of Bonaventure's works.[83] It also ripples through the reliefs at Orvieto, where, in the shape of trees it weaves the flow of natural process into the visualization of sacred scripture – which Bonaventure calls theology – on the façade, ordering its narrative from beginning (Genesis), through its bipartite middle (Tree of Jesse, New Testament Tree), to the end (Last Judgement).[84]

Arboreal imagery was being used to organize information, add depth of meaning and build relationships between different categories of knowledge well before Bonaventure. The earliest reference to a monumental tree diagram that I know of is an account of the East Syriac aesthetical writer 'Anân-Îshô', who represented Aristotle's classifications of categories in a Porphyrian Tree on the wall of his monastic cell in the seventh century.[85] Taught in university classes on Logic, the Porphyrian tree was impressed on the minds of every scholar in medieval Europe. The earliest surviving illustration of it as a flourishing plant is found in the copy of Peter of Spain's thirteenth-century *Tractatus (Summulae logicales),* once owned by Gerard of Abbeville (1225-72).[86] It was in this century, only a year before Bonaventure gave his inaugural sermon at the University of Paris, that Clare of Assisi wrote a letter to Agnes of Prague suggesting she meditate on episodes from Christ's life as if gazing into a mirror hanging on a tree (1253).[87] For

[83] Benson, "Bonaventure's inaugural sermon", 531-532; Benson, "The Christology of the *Breviloquium*", 253, note 17.

[84] Benson, "The Christology of the *Breviloquium*", 253.

[85] P. Wood, *History and Identity in the Late Antique Near East*, Oxford 2013, 75. "And the noble 'Anân-Îshô' composed definitions and divisions of various things, which were written upon the walls of his cell. And when his brother Mâr Îshô-yahbh came to pray in this monastery and saw the divisions of the science of philosophy of his brother ''Anân-Îshô' he begged him to write a commentary on them for him, and send it to him, which 'Anân-Îshô' actually did." Thomas of Marga, *Book of Governors: The Historia Monastica of Thomas Bishop of Marga AD 840,* ed. E.A.T.W. Budge, 2 vols, London 1893, II, 177-178.

[86] A.R. Verboon, "The Medieval Tree of Porphyry: An Organic Structure of Logic", in *The Tree: Symbol, Allegory and Mnemonic Device in Medieval Art and Thought,* ed. P. Salonius and A. Worm, Turnhout 2014, 95-116. For image, see:: 'Tree of Porphyry', Petrus Hispalensis, *Tractatus,* Paris, BnF, lat. 16611, f. 8v: https://gallica.bnf.fr/ark:/12148/btv1b90768515/f10.item.r=Petri%20de%20Hispania

[87] *Clare of Assisi: Early Documents 1216-1254*, ed. R.J. Armstrong, New York 2005, 54-58.

Clare the tree was a metaphor for the crucifixion and Christ presented the perfect example of humanity to which every meditant should aspire. Looking into the mirror, "she centres her contemplation upon the crucified Christ who she identifies as *that mirror*" and glimpses divine charity in its depths.[88] By picturing herself with Christ in the mirror, she could join him on the cross, so drawing closer to a true understanding of God and, following the growth of the tree, begin her ascent towards Paradise.[89] Bonaventure probably learned of Clare's mirror metaphor on his visit to LaVerna in October 1259 from brother Leo, who had been a companion to both Francis and Clare.[90] What is remarkable is that the same meditational practice of picturing Christ on the tree of the cross in terms of arboreal growth and ascent is prompted by the unfurling flowering vine of the cross on the full page *Te igitur* initial in a missal once held in the church of San Nicolò di Piazza in Assisi (Fig. 5).[91] This was the parish church of Francis and his family, where the saint went to consult "the Gospel of our Lord Jesus Christ" on 16 April 1208 to reveal God's will as to how he and his followers should proceed as he was founding the Franciscan order. Because the priest assisting Francis had no complete Bible at his disposition, he used his altar missal. Probably the same missal held in the Walters Art Museum in Baltimore today.[92] "Francis meditated on 'the form of the Holy Gospel' that God had revealed in the church of San Niccolò" for "as long as a year" before seeking approval from the pope.[93] On his return from Rome after the first approval of the rule, Francis is reported to have discussed his dream of a tall beautiful tree with his companions.[94] He believed the tree, that had bowed to him as he approached, symbolized the pope, who, upon hearing his petition, had bowed to his request. Evidently the majesty of trees was not lost on Francis, for whom they

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[88] J.M. Hammond, "Clare's Influence on Bonaventure?", in *Franciscan Studies* 62 (2004), 108.

[89] Salonius, "Tree of Life", 317.

[90] Hammond, "Clare's Influence", 109-112.

[91] *The Saint Francis Missal,* Baltimore, Walters Art Gallery, MS W.75, f. 166v. Illuminated *c.*1200. L.A. Herbert, "A Curator's Note: The Tarnished Reception of Remarkable Manuscripts", in *Illuminating Metalwork: Metal, Object, and Image in Medieval Manuscripts,* ed. by J.S. Ackley and S.L. Wearing, Berlin 2022, 443-462.

[92] A. Thompson, *Francis of Assisi: A New Biography,* Ithaca 2012, 22-23.

[93] Thompson, *Francis of Assisi*, 24

[94] Thompson, *Francis of Assisi*, 28.

must have been a potent image. Indeed, in his daily recitation of vespers, Francis repeated the lines from Psalms 96:9-12: "Tell among the nations that the Lord has ruled from a tree."[95] Whether the illuminated manuscript in the Walters Art Gallery is indeed the codex that inspired Franciscan rule, its presence in the parish church of San Nicolò of Assisi shows neither Bonaventure nor Clare were the first Franciscans to use arboreal imagery in their meditation of God.

This chapter has looked at the shape of scripture in the sculpted reliefs on the cathedral in Orvieto and the ideas – expressed in words – that gave it form. It is but an initial foray into the medieval understanding of images as a way of bringing scripture to life. More specifically, it considers how the visual language of trees – brimming with positive energy and the natural process of growth – presented complex juxtapositions, mirroring and the cyclic movement of ideas, as well as the spatial rendering of religious and philosophical texts, to all members of society. In Orvieto, thinking with arboreal images seems to have been recognized as a tangible force for improving the human condition. This study explores the Bible and Aristotle's division of categories as root sources for these monumental stone forms of arboreal expression and connects them to Franciscan thought, particularly that of Bonaventure. In the sculpted narrative at Orvieto, the learning process was governed by the directional flow of natural order, represented by the open-ended freedom of fractal growth in Nature, as seen in trees, but also in the imagery of a lovingly tended garden. At the boundary of the eternal time of God, on the wall of God's house, these images reference the promise of the Eucharistic miracle of the mass that lies within.

Independent scholar

[95] Thompson, *Francis of Assisi*, 147.

Fig. 1. Façade of the cathedral of Santa Maria Assunta, Orvieto.

Fig. 2. Pilasters of sculpted reliefs with “Stories from Genesis”, the “Tree of Jesse”, “Stories from the Life of Christ” and the “Last Judgement”, on the façade of the cathedral of Santa Maria Assunta, Orvieto.

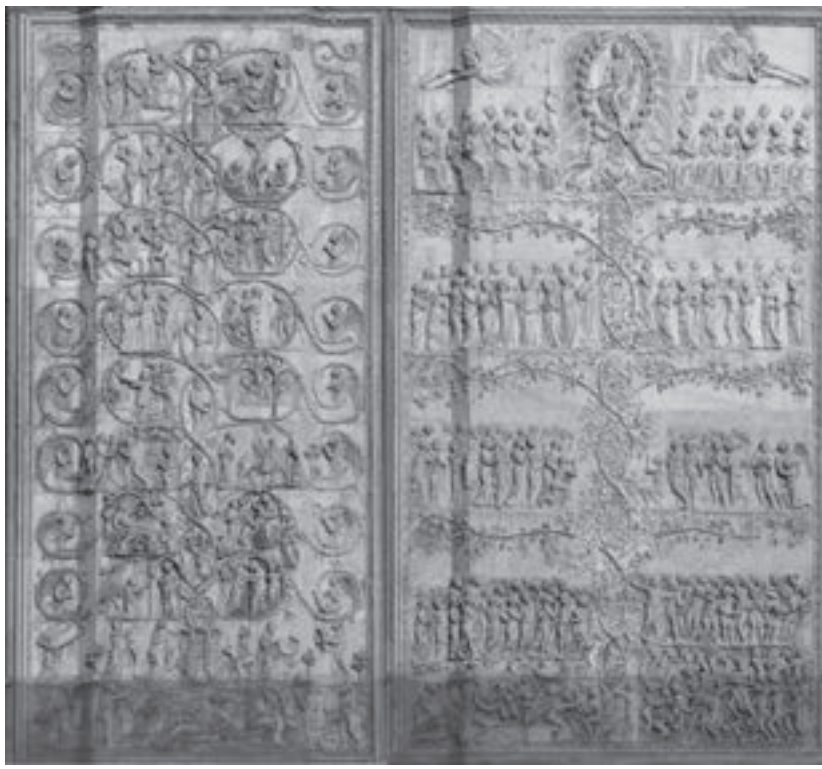

Fig. 3. ‘Old Testament Scenes (Genesis 5:22-8:9) with their spiritual lessons: typological parallels depicted in the Bible moralisée’, Bible moralisée, Paris (France). Oxford, Bodleian Library, Ms. Bodley

Fig. 4. ‘Tree of Jesse, with Jesse and Jacob in the lower left and right corners respectively’, in Gospel Book, Cathedral of Trier, MS. 141. A. 126, fol. 15r.

Fig. 5. 'Crucifixion in the form of "T" of Te igitur', in St Francis Missal, Church of San Nicolò, Assisi. 1172-1228. Baltimore, Walters Art Gallery, MS W 75, fol. 166v.

Ramon Llull and the *Ars Diagrammatica*

Albert Soler

Ramon Llull (ca. 1232-1316) was a Majorcan layman without formal studies who, towards the middle of his life (ca. 1263), felt a supernatural need to pious conversion, a fact not uncommon in the spirituality of the 12th and 13th centuries. The alteration of his life, in this case, included the project of writing "unum librum, meliorem de mundo, contra errores infidelium," according to his autobiography.[1] This book reached its first achievement in the monumental *Llibre de contemplació en Déu* [*Book of Contemplation on God*], but as soon as this work was finished, around 1274, Ramon received a divine "illumination" on the mountain of Randa (Majorca) by which God infuses the "formam et modum faciendi librum."[2] From this revelation, he wrote more than 260 works. It is striking, however, that in order to remain faithful to what was revealed to him, Llull constantly felt compelled to conceptually and formally innovate in his books.

The product of Randa's illumination was the Art, a system for thought foundation, for the discovery and communication of truth (Christian Truth, of course), free from the authority's arguments (including the authority of the Holy Scriptures), suitable for Muslims, Christians and Jews, and therefore with an apologetic purpose, above all.[3] Lullian Art had several versions in an attempt to make it more and

[1] Raimundus Lullus, *Vita coaetanea*, ed. H. Harada (CCCM 34), Turnhout 1980, 275. In addition to the archival documents and data provided by the colophons of his works, we have an almost autobiography, the *Vita magistri Raimundi*, also known as *Vita coaetanea*, dictated by Ramon to a monk of the Carthusian monastery of Vauvert, near Paris, in 1311.

[2] Raimundus Lullus, *Vita*, ed. H. Harada, 280: "subito Dominus illustrauit mentem suam, dans eidem formam et modum faciendi librum."

[3] For an introduction and user manual of the Art, see A. Bonner, *The Art and Logic of Ramon Llull. A User's Guide* (Studien und Texte zur Geistesgeschichte des Mittelalters 95), Leiden-Boston 2007.

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more accessible and understandable.[4] Through of his Art, Ramon will composed endless applications to the most varied sciences (medicine, law, theology, philosophy, geometry, astronomy...) in the most diverse genres and formats (treatises, sermons, novels, poetry, proverbs...), until reaching the number of works mentioned above.

It becomes clear, therefore, that Ramon's illumination had a creative impulse: it was not a closed revelation that had provided a way to make that book, the best in the world, and that it should be stated and not modified, if you wanted to be faithful to the order received. On the contrary, the different versions of Art show plurality of forms and dispositions. This is so because the illustration did not consist of a message but, as has already been said, of a system. A supernatural message is always problematic because the Revelation has already been given by Jesus Christ once and for all and, therefore, when someone claims to have received a new revelation, they should clarify what kind of nuance it brings regarding the original one. However, what was revealed to Ramon Llull in Randa was a new persuasion system regarding the Christian revelation truth, not a new truth. That is why the form has a substantial importance in the development of Llull's work and his concern about the way to express it, among other things, by the use of a wide range of visual resources in his works: text page, layout formats, diagrams, figures, and, within the latter, circular figures, trees, tables... and, more rarely, some symbolic representation.[5]

Llull expects readers to adopt a proactive attitude towards his works. Rather than telling them what to think, he sees them as means to develop their intellectual capacities. The Majorcan author even considers very different degrees of training and non identical intellectual starting points. Adapting to the diversity of audiences and circumstances, he

[4] From the initial *Ars compendiosa inveniendi veritatem*, composed as a consequence of illumination (ca. 1274), and *Ars demonstrativa* (ca. 1283), which are the core of the first phase of the Art. Until *Ars generalis ultima* (1305-1308), which closes the tour together with its abbreviated version, *Ars brevis* (1308), which, with the preceding *Ars inventiva veritatis* and *Ars amativa* (both from 1290) and the *Tabula generalis* (1293-94), make up the main versions of the second phase of the Art.

[5] M. W. Evans "The geometry of the mind", in *Architectural Association Quarterly* 12.4 (1980), speaks of four "main types of visual aid: the typographic, the stemmatic, the geometric and the emblematic" (§ 3.2).

writes his work in Catalan, Latin or Arabic;[6] and, for the same reason, he writes abstract treatises, romans inspired by the chivalric tradition or didactic poetry. In the background, there is always a method, the Art, which ensures the correct orientation of what is writing and what is reading.

A paradigmatic example (one among many) of Llull's desire to actively involve the reader in his work is the renowned ending of the *Llibre del gentil e dels tres savis* [*Book of the Gentile and the Three Wise Men*] (1274-1276). In the narrative fiction, Ramon envisages a gentile, someone who is pagan and ignores monotheism, improving his knowledge of faith through the three wise men's teachings, the three guides: a Jew, a Christian and a Muslim. After elucidating the disciple about the existence of a single God, about the creation and about the resurrection (truths that the three wise men admit), each one presents his own religion in a kind and respectful way so the gentile should choose one which he believes to be true. It is relevant how Ramon carries out a systematic exposition of the principles of the Mosaic law and Islam, with a responsible and sufficient knowledge of both and without clues that discrediting. Once the discussion is over, the gentile affirms that he already knows which of the three religions is the true one, but the wise men beg him not to tell them his choice because it would condition the continuation of their discussion. The book ends without explicitly declaring the protagonist's decision, so the reader, if he wants to access the solution, has no other choice but to emulate the gentile and start thinking in order to arrive at the truth on his own.

[6] Llull wrote a substantial part of theological or scientific works in his mother tongue, Catalan; at the same time, he encouraged the circulation of these works in other Romance languages. It is not an obstacle for him to write a considerable number of titles in Latin, or for some of these titles to have a double version, Catalan and Latin. Whatever the original language of a Lullian work, they are all part of the same intellectual project developed by someone who had an anomalous access to the world of knowledge and who organized the production and dissemination of his writings in an unconventional way. Although there is no doubt that they existed, we have not preserved Lullian works in Arabic. In L. Badia, J. Santanach and A. Soler, *Ramon Llull as a Vernacular Writer: Communicating a New Kind of Knowledge*, London 2016, it is proposed that all the peculiarity of the "Ramon Llull" phenomenon be interpreted as a manifestation of the process of vernacularization of knowledge which occurs in the fall of the Middle Ages.

This is an apologetic work, designed to demonstrate the effectiveness of Llull's method in a discussion about the truth or falsity of the three laws or book's religions. The reader must be a man of good faith, willing to follow the 'conditions' inscribed in the 'flowers' of the five symbolic 'trees'. They are binary combinations between the God's attributes, the virtues, and vices, which are associated by concordance or by contrariety. If these conditions of the discursive game are admitted, the incontrovertible triumph of Christianity is automatically imposed, without any participant in the debate feeling undermined or threatened. It is the victory of intelligence over the authorities. As A. Bonner has pointed out in his Art "user's guide":

> Perhaps the greatest difference between the Art and contemporary treatises, however, is that whereas the latter are primarily directed at offering solutions to problems or clarifications on points of doctrine, Llull's Art offers a method for arriving there, and if it gives solutions and clarifications – which it of course does – they are presented as inevitable by-products of that method.[7]

If the Lullian Art is capable of producing such a result, it is undoubtedly because it is an "Ars Diagrammatica". Thus, it is provided with a variety of visual resources that allow the reader to learn reasoning through an efficient way to reach the truth, and fully develop their faculties. In this paper, I propose to carry out a brief overview of the various types of visual aids used by Llull in his extensive work. Starting with the text's layout resources, passing through the diagrams themselves and a brief reference about the few symbolic representations. Finally, we will have a broader view of Llull's Art as diagrammatic reasoning.[8]

Layout of the text

Llull accomplished several versions of his Art while, at the same time, being the author of a particular *ordinatio* of the text which, in taking shape in the space of the page and the book, organizes and conducts mental reasoning[9].

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[7] Bonner, *The Art*, 298.

[8] In recent years, together with Anthony Bonner, we have developed a line of research on visual resources in Llull's opus that has given rise to several articles cited in the notes and of which this work is a synthesis.

[9] J. P. Gumbert "Le texte intellectuel, sa forme physique et les termes du metier", in

In the first version of the Art, *Ars compendiosa inveniendi veritatem* (ca. 1274, from now on *ArsComp*) Llull adopts layout formats that he will substantially modify in the following one, *Ars demonstrativa* (ca. 1283, from now on *ArsDem*), and will modify again in the drastic rethinking of the system of *Ars inventiva veritatis* (1290, from now on *ArsInv*). In the case of *ArsComp* and *ArsDem*, the arrangement and organization of the text has much to do with an extensive apparatus of graphic figures. Their components drawn in various colors have various fixed circular figures (*rotae*), diverse adjacency matrices that derive from those. There are also revolving circular figures – volvelles –, tables and an infinity of compartments called *camerae* in Latin.

In *ArsComp*, the written text is presented as an annex of graphic apparatus. Thus, we read in the prologue of the work:

> Haec *Compendiosa ars inveniendi veritatem* dividitur in quinque figures, quae sunt A S T V X. Et mediantibus istis quinque potest quis invenire veritatem sub compendio, et contemplando Deum virtutibus adherere et a se vitia extirpare.[10]

The work is not divided into chapters or parts but is structured around five circular figures (*rotae*). Next, five sections are presented, corresponding to the five *rotae*, each of one beginning in the same way "A [or S, T, V, X] ponimus quod sit..." The corresponding figure heads over the page, and is surrounded by a non-descriptive text that introduces general considerations about it. Up to a certain point, the image could be considered sufficient: the writing shows itself as a figure's gloss.

Actes du colloque Terminologie de la vie intellectuelle au moyen age. Leyde - La Haye 20-21 September 1985, ed. O. Weijers, Turnhout 1988, 96-104, distinguishes between intellectual text and material text (the physical form that shapes the former) and refers to the relationships of proximity or distance that are established between one and the other.

[10] A. Bonner and A. Soler, "La *mise en texte* de la primer versió de l'Art: noves formes per a nous continguts", in *Studia lulliana* 47 (2007), 36.

Fig. 1. Vat. lat. 5112, f. 5va. Section on the figure T of Art (*rota*) (ArsComp)

The importance of the figures in *ArsComp*'s *mise en texte* highlights the relevance that Llull gave to them already in the first version of Art. They bring together all its components, which are general in the entire system, and allowed its combinatorial mechanisms.

Fig. 2. Vat. lat. 5112, f. 6r at the bottom, the *Elemental Figure* (*in table form*) and, at the top, the Third Figure in adjacency matrix form T of ArsComp

The first presentation of the Lullian system could cause a deep sense of strangeness in a medieval reader habituated to more conventional texts in which graphics are mere illustrations of written discourse with pre-eminence and driving the reasoning's advancement. In *ArsComp*,

the relationship established between text and image and the circularity of the discourse that develops from this relationship pose important challenges to the reader. For example, in the presentation of Figure A, it speaks of S, T, V, X, Y, Z when the reader still has not the remotest idea of what those letters mean. It is only when this prologue on the five figures is read that the reader feels the need to go back to the beginning to understand what is explained in such a peculiar way.[11]

All these problems are solved in *ArsDem* thanks to a more linear organization of discourse. In the first place, the list of figures, which has been considerably expanded, offered at the beginning of the work, in a quire, he put together all of these except the adjacency matrices, which continue to be integrated into the text. Second, a conceptual alphabet is established at the beginning of the discourse:

> Quoniam haec *Ars demonstratiua* sequitur regulam *Artis compendiosae inueniendi ueritatem*, nos ideo alphabetum illius artis accipimus ponentes et ordinantes ipsum in hac arte; quod siquidem alphabetum tale est: A ponitur esse Deus. B memoria recolens. C intellectus intelligens [...][12]

Third, each figure is introduced and described in detail in the text and in those descriptions references are made to the initial on the graphic images. Thus, Figure T has a formal description that is absent in *ArsComp*:

> Prima enim circularis est, ex quinque triangulis uariorum colorum composita, prout apparet in principiis huius artis.[13] (1) Quorum triangulorum unus liuidus est, significans Deum in uno angulo, et creaturam in alio, atque in alio angulo operationem. (2) Et alius triangulus uiridis est, significans in uno angulo differentiam, et in alio concordantiam, atque in alio contrarietatem. (3) Alius uero triangulus rubeus est, significans in uno angulo principium, in alio medium, et in alio finem. (4) Alius etiam triangulus croceus est, significans in uno angulo maioritatem, in alio aequalitatem, atque in alio minoritatem. (5) Atque alius triangulus niger est, continens in uno angulo affirmationem, in alio dubitationem, in alio negationem, prout apparet manifeste in principii huius artis.[14]

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[11] For a detailed analysis of *ArsComp* layout issue, see Bonner and Soler, "La mise en texte".

[12] Raimundus Lullus, *Ars demonstrativa*, ed. J.E. Rubio Albarracín (CCCM 213), Turnhout 2007, 4.

[13] It refers to the quire with the graphic images that heads the work in the manuscripts.

[14] Lullus, *Ars demonstrativa*, ed. Rubio, 17

Fig. 3. Kues, Bernkastel-Kues, Nikolaus Hospital, ms. 83, f. 1v Figures S, T, Y, A, Z, V, X of *ArsDem*

The first clash with real audiences probably prompted a profound reorganization in the way the Lullian Art was presented, an aspect that is reflected in the arrangement of text and figures in the codices, in order to achieve a more efficient transmission of information.

On the other hand, in *ArsDem*, the visual resource of the *camerae* gains special strength, that is, the compartments with letters – or terms – that come from combinations of principles of the Art. They are used more extensively and systematically in *ArsDem* than in *Ars-*

Comp or any other version of Art. In the manuscript – 220h of the Martinus-Bibliothek of Mainz – copied by Guillem Pagès – a scribe in the service of Llull for more than twenty-five years, from whom we have preserved six codices that have a special value for the study of the original formats[15] of Llull's works – all the text of the compartments was made by copying the terms in black ink and tracing the box frame in red ink, so that they stand out clearly on the page.[16]

Fig. 4. Mainz, Martinus-Bibliothek, ms. 220h, f. 39v-40r. Prominence of the boxes in the fourth distinction, "De quaestionibus", of *ArsDem*

The next version of the Art, *ArsInv* (1290), represents a crucial moment in the development of the Lullian system because it proposes a drastic reformulation, undoubtedly due to the difficulties that Ramon experi-

[15] For a comprehensive study of the codices copied by Guillem Pagès, see A. Soler, "Estudi històric i codicològic dels manuscrits lul·lians copiats per Guillem Pagès (ca. 1274-1301)", in *Arxiu de textos Catalans Antics* 25 (2006), 229-266.

[16] For a study of the visual resources in *ArsDem* see A. Soler, "Els recursos visuals a l'*Art demonstrativa* de Ramon Llull: impaginació i figures gràfiques", in *Llengua & Literatura* 32 (2022).

enced in getting his system recognized. The *Vita magistri Raimundi* points out Ramon's motivation to prompt a completely remake of his system due the unfavorable reception of *Compendium seu commentum Artis demonstrativae* in Paris. A work that, as its name indicates, depends on *ArsDem*:

> Veniens ergo Raimundus Parisius tempore cancellarii Bertoldi, legit ibidem in aula sua *Commentum Artis generalis* de speciali praecepto praedicti cancellarii. Perlectoque Parisius illo *Commento*, ac ibidem uiso modo scholarium, ad Montem rediit Pessulanum. Vbi de nouo fecit et legit etiam librum ipsum uocans eundem *Artem ueritatis inuentiuam*; ponendo in ipso libro, nec non et in omnibus aliis libris, quos ex tunc fecit, quattuor tantum figuras, resecatis seu potius dissimulatis propter fragilitatem humani intellectus, quam fuerat expertus Parisius, duodecim figuris ex sexdecim, quae prius erant in Arte sua.[17]

In the eleventh miniature that illustrates the *Vita magistri Raimundi*, in his *Breviculum*, Thomas Le Myésier, Llull's most outstanding disciple in Paris, asks the master permission to summarize his vast work and gives a view that possibly sums up that of the Parisian academic environment. He does this partly because:

> alleviare studium et fatigationem oculorum, confusionem significatorum alphabeti *demonstrativae Artis* et sexdecim eiusdem Artis figuris, quae confundunt intellectum.[18]

The main problem identified in this quoting, about the use of *ArsDem*, is the abundance of alphabetic figures symbols in the Art. The challenge was to simplify and to organize those materials in such way that would be less innovative and apparently unique to appeal to the academic habits of reading and reasoning. For readers, the most important drawback of *ArsComp* and *ArsDem* was Ramon's use of artificial language, based on alphabetic symbols organized in diagrams. A language that he wanted to be completely intellectual and was far removed from natural language. *ArsInv*, on the contrary, will develop a discourse built from ontological definitions that allow arguments to be generated through propositions that run as axioms, something that was much

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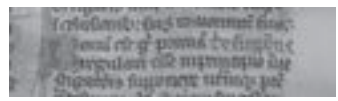
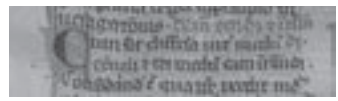
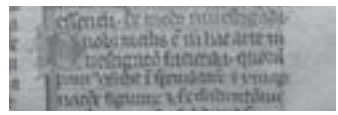
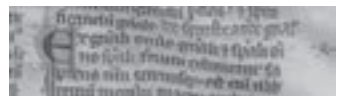
[17] Raimundus Lullus, *Vita*, ed. Harada, 283.

[18] Thomas Migerius, *Breviculum seu Electorium parvum*, ed. Ch. Lohr, Th. Pindl-Büchel y W. Büchel (CCCM 77), Turnhout 1990, 45. This is a deluxe manuscript version of the *Vita magistri Raimundi* dedicated to the queen of France enriched with twelve magnificent illustrations made in 1325. Thomas Le Myésier, Canon of Arras, was court physician.

more familiar to contemporary readers. In this sense, the reduction of the number diagrams from *ArsDem* to *ArsInv* – from twelve to four, which have such a secondary role that makes them superfluous – is quite meaningful[19].

We have preserved an *ArsInv* manuscript related directly to Llull. It shows a layout project designed by him, with the help collaborators and copyists, for the new version of the Art. The Munich codex, Bayerische Staatsbibliothek, Clm. 10501, in which the decoration and structure are closely related to the writing of the text, shows that the organizing and retrieving of information through layout becomes a powerful visual resource. Thus, in the third and fourth distinctions of the work, with the intention of making the text more accessible, each chapter begins (see the table below, first and second column) with a word whose initial letter corresponds to the letters of the Art's Alphabet B-K. A letter that later appears in the running titles of the folios (third column). Let us see, as an example, the case of the first four chapters of the third distinction, on the Rules of the Art:

Bonum est igitur primam regulam esse in principio...		
Cum sit differentia inter modum essendi rei et modum eam intelligendi...		
Duobus modis est in hac arte inuestigatio facienda, quorum primus consistit in speculatione...		
Ex generali omnino generali et speciali tertium constituitur...		

The function of the current titles is even more important in the fourth

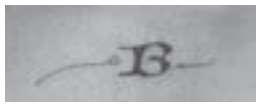
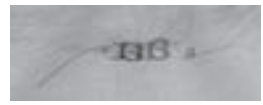
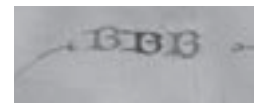
[19] A. Bonner, "Supplement", in *The Art and Logic of Ramon Llull. A User's Guide (Studien und Texte zur Geistesgeschichte des Mittelalters 95),* Leiden-Boston 2007, 31; electronic publication <https://www.ub.edu/llulldb/bibliografia/9319>

distinction of *ArsInv* "De quaestionibus" in which nine questions corresponding to the letters A-K are resolved in three different ways corresponding to the first distinction (on the figures), the second (on the conditions) and the third (on the rules). In the manuscript, this structure deserves a singular layout treatment that, at the same time, outlines the text. Readers guided by it can spot specific questions or its resolution. The first mode is always preceded by a pen-flourished initial of a two lined sheet, parted letter[20], and cascade, to resemble the letters of questions B-K: B for the first, C for the second, etc.

Instead, the second and third modes are marked only with a cascade and pen-flourished initial, the letter no longer corresponding to Alphabet B-K.

[20] Parted letter is that "Lettre dont les parties pleines sont subdivisées dans leur longueur, selon une ligne ondulée, brisée ou échancrée, en deux moitiés dont chacune est peinte d'une couleur différente", D. Muzzerelle, *Vocabulaire codicologique*, s.v. "Lettre émanchée", electronic resource, <http://www.palaeographia.org/vocabulaire/vocab.htm> (accessed 14/01/2022). It should be noted that the parted letters were more laborious to make – they were charged at a different, higher price than the other initials, only pen-flourished initials – and, therefore, indicated a higher level in the text order.

The running title of the quoted folios points out the combinatory solutions according to the first mode with the same initial letter B-K to list the nine questions. The running titles of the second mode carry two letters in the running title; and the third has three letters; always with the letter that corresponds to each of the nine questions.

In short: the parted letter that opens the first mode of each question and the running title that indicates the folios where the solution is presented, act as markers that allow the reader to identify the question amongst the nine and to locate it if necessary. On the other hand, the style of the running titles, which mark with one, two or three letters B-K each mode of each question, identifies which of the three modes the reader is accessing or how to locate it.

The interrelationship observed between the writing of the work and the material realization of the copy, in the manuscript Clm. 10501, enables the study of aid elements that academic books had already fully incorporated in the 13th century to define the work *ordinatio*: running titles, rubrics, hierarchical initials, paragraph marks (Pied-de-mouche), numbering. In this sense, the written page of the mentioned manuscript is not a simple text record, but rather the visual representation of its organization.[21]

Graphic devices: graphs, hypergraphs, and tables

In the previous section, I have referred to different types of graphic representations of Lullian Art: *rotae*, volvelles, *camerae*, adjacency matrices, tables. However, more important than establishing a formal typology of these devices is to know how they work, the use that the system gives to elements and the reason for that use.[22]

[21] For a study of the visual resources in the manuscript Clm 10501, see A. Soler, "Raonament intel·lectual i materialitat del text: el cas de l'*Ars inventiva veritatis* de Ramon Llull", in *Comprendre* 21,2 (2019), 57-73.

[22] For a detailed study of the nature and function of figures in Art, see A. Bonner

The main devices are the Alphabet, the Figures, and the Table. The Alphabet assigns letters to various concepts of the Art. In *ArsDem*, the twenty-three letters of the medieval Latin alphabet represent a complex display of concepts and figures. From the reformulation of *ArsInv*, in which the number of principles is reduced from sixteen to nine, the letters from B to K represent the six concepts of each series of the components of the Art.

Figures are used to gather various Art concepts into homogeneous sequences. Most of the figures in *ArsComp* and *ArsDem* are graphs, representations of binary relations established between elements in a set. In graph theory, the elements are called vertices and the lines that join them, edges. In the case of Art, graphs show connections between pairs of concepts. Let us see Figure A of *ArsDem,* which brings together the sixteen divine attributes or dignities:

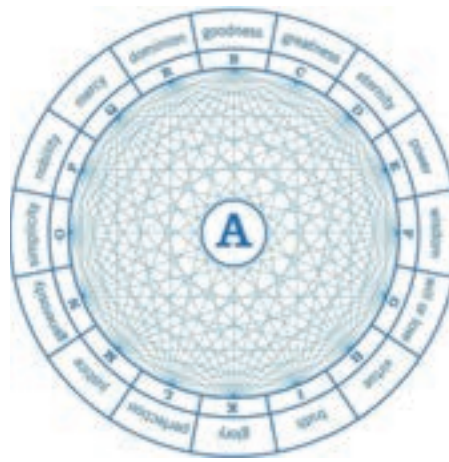


Fig. 5. Figure A of *ArsDem*

In this figure, all the vertices are connected to each other. In this way, it is indicated that divine attributes fully agree with each other. The graph itself is in the network of interior lines; the external *rota* serves only to contain the set of divine attributes.

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and A. Soler, "Les figures lul·lianes: la seva naturalesa i la seva funció com a raonament diagramàtic", in *Studia lulliana* 55 (2015), 3-30.

The same figure, called The First Figure, in *ArsInv* reformulation no longer has edges connecting the vertices and therefore it is no longer a graph:

Fig. 6. First Figure of *ArsInv*

ArsInv does not work through the binary combination of principles, which is why the edges of the figure disappear. The use of a *rota* to collect the set of principles is only a formal vestige of the previous figure: it could have been replaced by a list in a table form.

In *ArsComp* or *ArsDem*, the representation of the pairs of concepts connected by lines in Figure A can take a tabular form that, in graph theory, is called an adjacency matrix. Normally, a matrix that includes all possible combinations would be a square. However, in the Art, the distinction between the pair "goodness greatness" from the pair "greatness goodness" is useless, and therefore only half of each matrix will be represented, which will give rise to a triangular shape, like the one in Second Figure of Figure A:

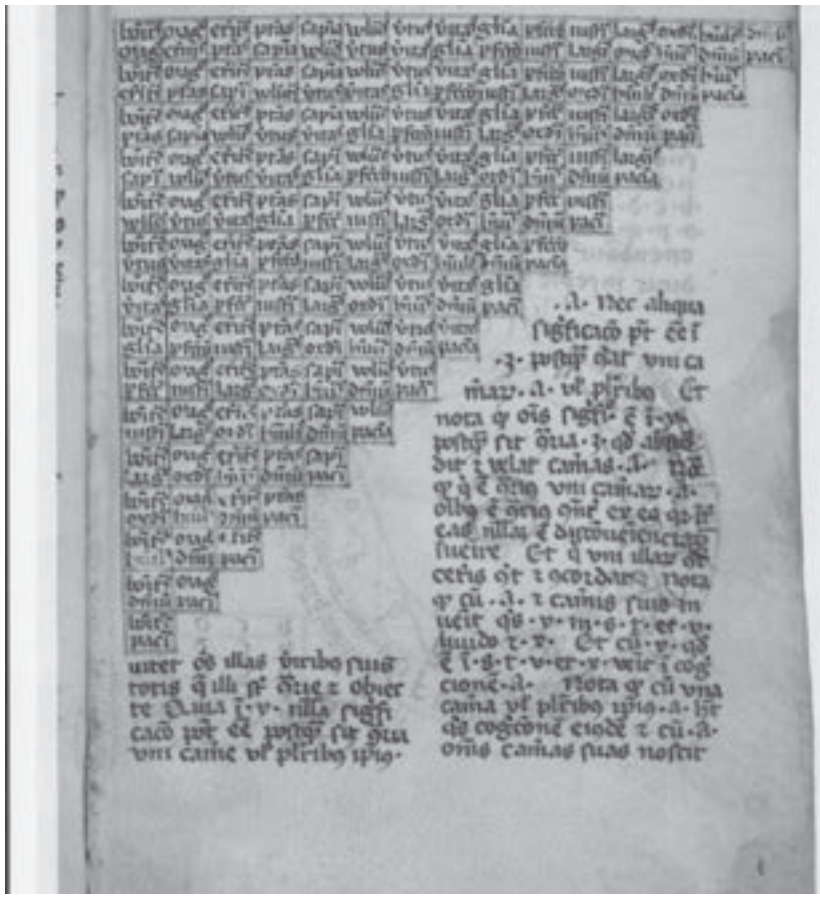

Fig. 7. Vat. lat. 5112, f. 4r Second Figure of Figure A of *ArsComp*

It is another way of showing the same information: the binary relationships between basic concepts of the Lullian system. But the Lullian Art also works with combinations of more than two elements, especially from *ArsInv*. To do this, Llull will use volvelles, that is, circular figures with moving wheels, which constitute hypergraphs with hyperedges that can link more than two vertices. This is the case of the Demonstrative Figure of *ArsDem*, which in the manuscripts has been executed by drawing the discs of the figure, mentally movable, or, more rarely, cutting parchment discs and sewing them through the center.

Fig. 8. Nikolaus Hospital, ms. 83, f. 2r Demonstrative Figure in double format: as a volvelle and in two-dimensional representation

In *ArsInv*, Fourth Figure is also a hypergraph in the form of a volvelle and represents ternary combinations of nine letters.

Fig. 9. Uppsala, Universitetsbiblioteket, ms. C51, f. 105r, Fourth Figure

All the possible ternary combinations of the Fourth Figure are resolved explicitly in the Table, with 84 columns of 20 components each, which Llull introduces from his work *Tabula generalis* (1293-1294).

The Elemental Figure stands out in the graphic apparatus of the Art's[23] first versions. It has an appearance of a table made up by four quadrangles – one for each of the four elements – with sixteen compartments. Here the quality of each element has been added between square brackets: fire is hot, earth is dry, water is cold and air is humid.

The Figure of Fire [heat]

fire	air	water	earth
air	fire	earth	water
water	earth	fire	air
earth	water	air	fire

The Figure of Air [moisture]

air	fire	water	earth
fire	air	earth	water
water	earth	air	fire
earth	water	fire	air

The Figure of Water [cold]

water	earth	air	fire
earth	water	fire	air
air	fire	water	earth
fire	air	earth	water

The Figure of Earth [dryness]

earth	water	air	fire
water	earth	fire	air
air	fire	earth	water
fire	air	water	earth

Fig. 10. Elemental Figure

Gradation, which Llull systematized in his own way, was the way in which medieval science usually measured the intensity of the simple elements present in compounds. If the Elemental Figure has the form of a quadruple table, it is because Llull does not intend to express concepts in terms of their relationship (which would be represented by a graph) but rather to value those relationships as quantitative or qualitative comparisons. In the Lullian theory of elements and intensity degrees of elementary qualities, it will be essential to introduce the concept of "equal or superior" (≥) and therefore the notion of lattice of mathematical set theory.[24]

The interaction of all these graphic elements gives rise to a combinatorial. Llull, in harmony with medieval logic, conceived of his Art as a tool for forging judgments and syllogisms. It was for this purpose that he began to assign letters to various Art concepts in *ArsComp*.

[23] See for example the Elemental Figure of *ArsComp* in the lower part of illustration 2.

[24] See a detailed study of the Elemental Figure as a lattice in A. Bonner and P. J. Planas, "La farmacologia de Ramon Llull: de la medicina en la figura elemental als reticles matemàtics", in *Studia lulliana* 62 (2022), in press.

Later, by means of combinations of letters, he established the necessary relationship between the terms of a judgment or of a certain number of judgments. Llull called this operation "the formation of compartments." From *ArsInv*, the use of letters disappears from the text of the Art, which is based on the definitions of the concepts under discussion and acquires a propositional aspect. All Art was directed towards a specific goal: to discover in any subject area the appropriate terms to form judgments and syllogisms, and to build logical reasoning through necessity.[25] It is here, in this attempt, naive and brilliant at the same time, to mechanize knowledge, where the peculiar power of seduction that the Art of Llull has exerted throughout history originates, from the time of Nicholas of Cusa to that of Leibniz.

The symbolic dimension of graphic representations

Throughout his work, Llull shows little interest in symbolic figurative representations. We are wrong if – as it has sometimes been done – we give a symbolic interpretation to the circularity of Figure A (illustration 5) of the Art, which represents God, because what matters in the diagram is not the circumference that contains the sixteen divine dignities, but the star drawn by the edges that join them to form a mathematical graph; the outer circumference is perfectly expendable.

The figures that we see him developing in the following versions of his Art are not of a symbolic nature, but have a functional nature, they are executed with a formal sobriety that tends to accentuate with their evolution and they do not offer any margin for artistic figuration. In *ArsDem* we will find that Figure V, which represents the set of virtues and vices, has double color, blue and red respectively for virtues and vices, colors with very obvious connotations but with little effective relevance regarding their operation.[26]

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[25] For a study of the Art and the evolution of its components see Bonner, *The Art* and now, the supplement to this manual, Bonner "Supplement".

[26] For the use of color in the works of Ramon Llull, see L. Badia, "Natura i semblança del color a l'opus lul·lià: una aproximació", in *Studia lulliana* 43 (2003), 3-38. On the other hand, among the oldest Lullian manuscripts, only in the Munich, Bayerische Staatsbibliothek, Clm. 18446 the figures of *Ars compendiosa* (1299) appear richly decorated and illuminated; and only in one of them do we find a certain symbolic representation: the Fourth Figure of the Art, a volvelle to which reference has already been made, contains the figure of a little man in an attitude of moving the central wheel.

Fig. 11. Figure V *ArsDem*

The figures of Art are not, in any sense, an illustration of a discourse, they do not embody a visual or symbolic representation of any reality, neither are they representations of any specific thought. On the contrary, they are only instruments that the reader must use to generate scientific or contemplative arguments. We could say that they are something to the extent that they are put into operation by someone, the Art's user. Therein lies its diagrammatic character.

In works that are not strictly artistic, but in derivations or applications of Art, or even in works prior to Art, we find another type of figure with a structuring function of discourse and, at the same time, also a symbolic one: tree diagrams. Perhaps the oldest and clearest example of this dimension is offered by the *Llibre de contemplació*, in book IV, which is divided into six distinctions (XXXIII-XXXVIII), each of which deals with a different, schematically represented, tree. In total, then, six trees. For example, in chapter 255, distinction XXXVII, there is a "Tree of the Ten Commandments." In the copy of *Llibre de contemplació* executed by Guillem Pagès, of whom we have already spoken, completed in July 1280 – the oldest dated Lullian codex, very close to Llull's lifetime –, the tree looks like this:

In reality, it is an anecdotal illustration that in no way contributes to the functionality of the figure and, furthermore, it must be taken into account that this codex, despite being contemporary, cannot be directly linked to Llull.

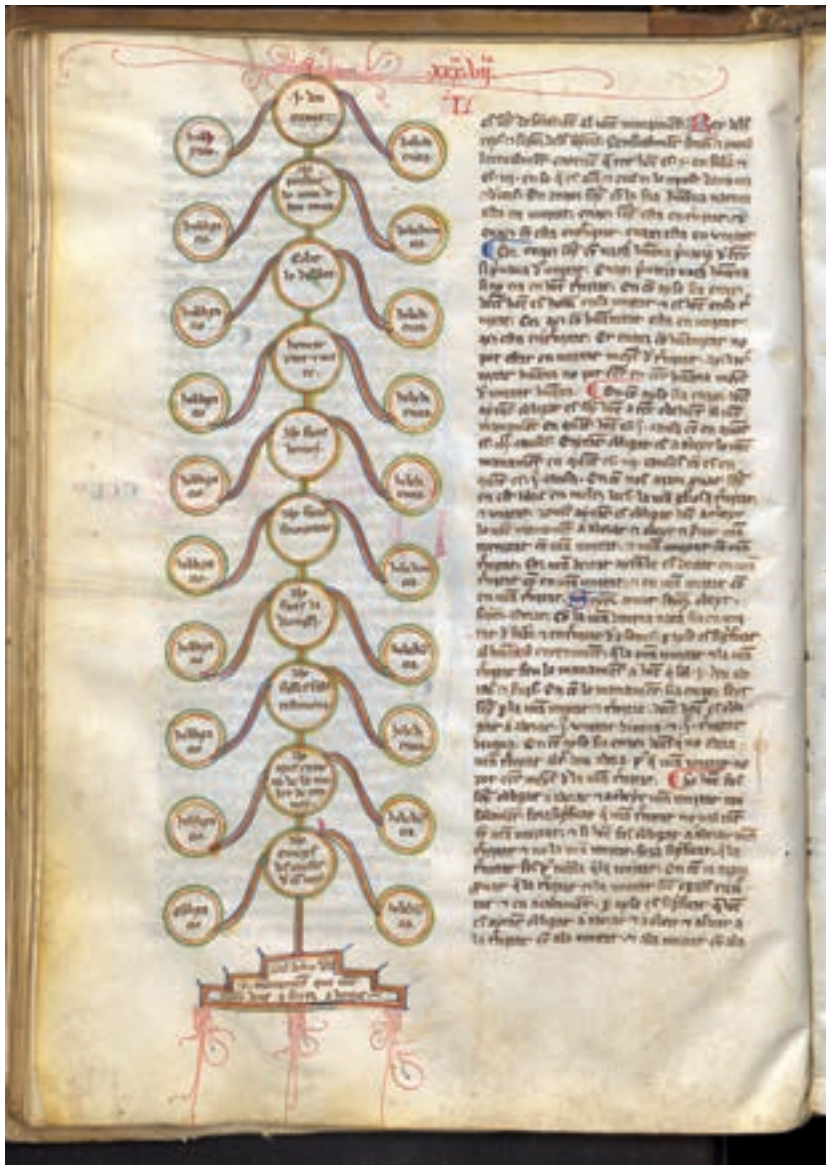

Fig. 12. Milan, Biblioteca Ambrosiana, ms. D 549 lower, f. 304bisv, "Tree of the Ten Commandments" from the *Llibre de contemplació* (ch. 255)

Each of the Ten Commandments appears in descending order on the tree's trunk and each one is related to the concepts of 'obligation' and 'obedience' that appear on the leaf that springs from each Commandment from left to right of the trunk. In other words, it is being indicated that the concepts of 'obligation' and 'obedience' will be present in each chapter of the distinction, which will deal with each Commandment. It is a visual outline of the chapter's contents. The same relationship that is established between tree's concepts and Commandments could be expressed diagrammatically as follows:

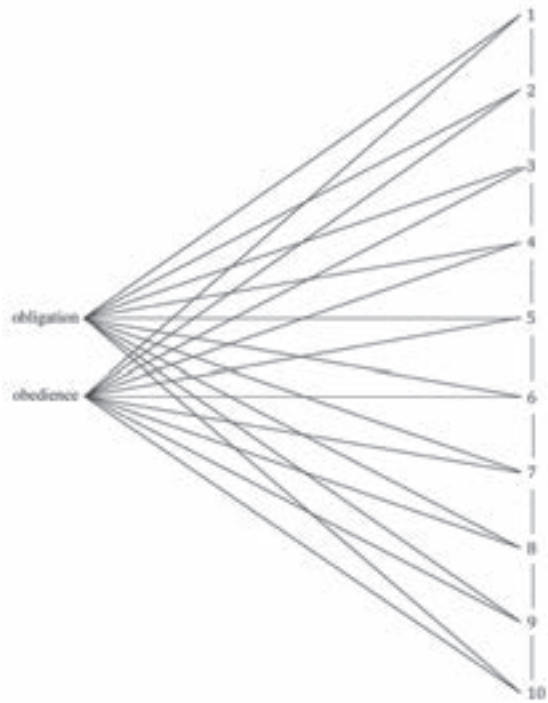

Fig. 13. Diagrammatic representation of the content of the "Tree of the Ten Commandments" from the *Llibre de contemplació* (ch. 255)

Strictly speaking, it was not necessary for Llull to draw a tree in order to visualize the relationship between the components of the XXXVII distinction. If he does it, it is because the tree is a figure sanctioned by the iconographic tradition that allows a diagram to be embellished figuratively and symbolically.

In the previous distinction, XXXVI, of the *Llibre de contemplació*, chap. 238, the "Tree of faith and reason" is represented in the figure of the cross. The figure gives rise to a singular page in which the text accommodates itself to the shape of the cross. The enumeration of the exhibition contents is noted in a rubric on the arms of the cross, with the peculiarity that the rubrics that go on the arms of the crossbar have been copied vertically.

Fig. 14. Ambrosiana, ms. D 549 lower, f. 278v, "Tree of faith and reason in the figure of the cross" from the *Llibre de contemplació* (ch. 238)

Unlike the "Tree of the Ten Commandments," this figure does not interrelate the concepts, but simply lists them. It is, then, a visual and emblematic index of the distinction's contents. The idea of tree is associated with the symbol of the cross and this endorses the name of the figure. Finally, the figure seems to be justified implicitly (but not in an open way) by the theme of the XXXVI distinction: it could suggest that the presentation of the fourteen articles of the Christian faith that is developed in chapters 245-254 has its symbolic foundation in the mystery of the cross.[27]

Graphic images and verbal descriptions: Lullian diagrammatic reasoning as a mental activity

The graphic images materially grasped in the codices are not the only type of images that Llull displays in his works. Textual descriptions of images, the procedure that classical rhetoric knows as *ekphrasis* – ἔκφρασις, *descriptio* in Latin treatises –, also play a fundamental role in Lullian diagrammatics. In Llull's opus we find numerous examples of ekphrastic speeches. For example, in chapters 352-357 of the *Llibre de contemplació*, Llull develops a particular method of contemplation inspired by the four meanings of Scripture in biblical exegesis. Narrative texts that exemplify a new theory of allegory present startling and dazzling imagery that could have been the subject of fanciful symbolic illustrations. However, Ramon chooses to develop a completely discursive description so that the reader has to form a mental idea of what is exposed.[28]

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[27] For a detailed study of the presence of graphic elements in the six manuscripts copied by Guillem Pagès, a scribe in Llull's service to whom I have already referred, see now G. Pomaro, "Dall'ars scripta all'ars figurata: Raimondo Lullo (1232-1316) e la tradizione figurata dell'ars combinatoria", in *Scribes and the Presentation of Texts (from Antiquity to c. 1550): Proceedings of the 20th Colloquium of the Comité international de paleographie latine. Beinecke Rare Book & Manuscript Library, Yale University (New Haven, September 6-8, 2017)*, ed. B.A. Shailor and C.W. Dutschke, Turnhout 2021, 411-437.

[28] The most prominent is the contrast between body and soul in chapter 354, which features three maidens and a two-headed beast, rising and falling on the ends of a scale. See J.E. Rubio, "A capítol en l'ús de l'al·legoria en Ramon Llull: exegesi del capítol 354 del *Llibre de contemplació*", in *Studia lulliana* 47 (2007), 5-27 for an analysis of this chapter.

In works derived from Art, but not strictly artistic, we find detailed descriptions of figures in their absence. This is the case of *Arbre de ciència* [*Tree of Science*] (1295-1296), which is the work that presents Llull's vision of the world in more detail. Fourteen trees make up the "Tree of Science" complex: from the elemental and vegetable trees to those of Jesus Christ and God. To these, two instrumental trees are added, that of examples and that of questions.[29] Thus, we have sixteen trees that make up a single "Tree of science." Each of those trees is described in detail in the text but not graphically represented in any of the older testimonies. The ekphrastic discourse exposed is the most elaborate found in Llull's opus and gradually builds the mental image of the Tree of trees, which is impossible to represent bidimensionally, since it is a tridimensional object: a tree in which multiple tree structures come together, blurring into their unity to become part of a whole. The use of ekphrasis allows one to mentally evoke the character of Llull's ontology: a unified body with all its parts interrelated in an orderly manner. Furthermore, Llull does not want to compile an encyclopedia in which the diversity of the world is presented in an orderly manner, separating its parts; instead, he intends to show simultaneously the indissoluble unity of the world in its constitutive diversity.[30]

The use of ekphrasis also affects the figures of the Art because sometimes the diagrams are presented without any description, as in *ArsComp*; in others, with a displaying of figures and its functioning into the image, as in *ArsDem* or *ArsInv*. The description of figures concerning their graphic representation entails an interaction between text and image. Llull himself expresses it at the beginning of the tree figure's description in the *Liber principiorum medicinae*: "Naturale quidem est intellectui, ut ipse per demonstrationem factam per uisum et

[29] For the structure of the work, see A. Bonner, "The structure of the Arbor scientiae", in *Arbor Scientiae: der Baum des Wissens von Ramon Lull. Akten des Internationalen Kongresses aus Anlass des 40-jährigen Jubiläums des Raimundus-Lullus-Instituts der Universität Freiburg i. Br.* (Instrumenta Patristica et Mediaevalia. Subsidia Lulliana 1) ed. F. Domínguez Reboiras, P. Villalba Varneda and P. Walter, Turnhout 2002, 21-34.

[30] For the *Arbre de ciència* as an ekphrastic discourse, see A. Bonner and A. Soler, "La representació de l'arbre en l'*Arbre de ciència* de Ramon Llull", in *Imago* 8 (2016), 131-142, and A. Bonner and A. Soler, "Representació gràfica i èctrasi en l'obra de Ramon Llull", *Magnificat Cultura i Literatura Medievals* 3 (2016), 74-80.

per auditum melius intelligat, quam per auditum solum."[31] For Ramon, the conjunction of both presentations, verbal and graphic, is preferable. In this same work, a very detailed tree's description is provided, which is depicted in many manuscripts, one of which corresponds to a manuscript copied by Guillem Pagès during the author's lifetime. Llull states the relevance for readers of the tree's graphic image, something that he expressly recommends at the end of the description:

> Quicumque autem hanc artem intelligere et scire desiderat, oportet ipsum scire perfecte alphabetum superius positum et ipsum in memoria semper retinere; et etiam oportet ipsum facere flores alios similes floribus dictae arboris fabricatos et mobiles, ut alios ipsorum florum cum aliis commiscere et formare demostratiue possit, necnon ipsos augmentare et diminuere ac etiam adaequare ad declarandum, qualiter medicus suas debet componere medicinas.[32]

This recommendation to build a mobile figure for personal use, based on the figure described, constitutes an invitation to develop an autonomous work with the graphic resources and the possibilities offered by them. In any case, the verbal description of the diagrams, whether long or brief, underlines their importance, so the reader does not overlook that they are an essential instrument for organizing and codifying the foundations of the entire combinatorial apparatus of the system: they are the elements that articulate the diagrammatic reasoning of the Art. The assimilation of the figure's morphology and their operations represented by material and mental visualization looks for the rational soul elevation from intellectual knowledge to spiritual contemplation. Thus, he declares it in *Ars amativa*:

> Ratio quidem, quare figuras tradimus in hac Arte consistit, ut in eis fiat principiorum huius Artis speculatio; sensuali namque speculatione extollitur intellectus ad speculandum intellectualia, et inde uoluntas ad ea diligendum.[33]

Both in their plastic and verbal dimension, the figures are a tool that helps meditation and contemplation, in the intellectual as well as in the

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[31] Raimundus Lullus, *Liber principiorum medicinae*, in *Quattuor Libri Principiorum*, ed. M. A. Sánchez Manzano (CCLM 185), Turnhout 2006, 438-439. For the use of ekphrasis in the works of Ramon Llull, see Bonner and Soler "Representació gràfica".

[32] Raimundus Lullus, *Liber principiorum medicinae*, 445.

[33] Raimundus Lullus, *Ars amativa boni et Quaestiones quas quaesivit quidam frater minor*, ed. M. M. M. Romano y F. Santi (CCCM 183), Turnhout 2004, 124.

spiritual sphere. The Lullian Art gathers structure and systematization to this exercise.

Ramon proposes an unavoidable reader's commitment in the process of elevating the soul, which can take various forms throughout his work. Sometimes it is about posing an apparent darkness of the proposed discourse as an intellectual challenge to overcome.[34] Others, it is about leaving the end of a work open, with no apparent solution, so that the reader should find it, as the *Llibre del gentil* referred above. Or even proposing a remarkable apparatus of questions and answers to assimilate a certain version of the Art. This last resource is part of a more general program that he calls "habituation", which consists not only in finding solutions to questions, but in formulating and solving new questions that the reader must place on his own. As he says in the penultimate section of *Ars brevis* (1308):

> Haec pars est de habituatione huius Artis. Et ipsa diuiditur in tres partes. Quarum prima est de tredecim partibus, in quas haec Ars diuiditur. Et illas artista huius Artis debet habituare, ut ipse sciat applicare quaestionem ad illum locum seu loca, quaestioni dispositum seu disposita secundum proportionem materiae quaestionis.
>
> Secunda pars est, quod habituet modum et processum textus huius Artis, tenendo modum textus ad probandum et soluendum quaestiones peregrinas illo modo, per quem sunt explicatae in textu: sicut unum exemplum, per quod aliud est declaratum et exemplificatum. Tertia pars est, quod ipse habeat modum multiplicandi quaestiones et solutiones ad unam et eandem conclusionem [...][35]

Llull looks forward reader to make figures work that express the essential connectivity of the system, so that he develops dynamic and open knowledge processes, in which anyone could participate in the act of finding (*invenire*) questions and formulating new answers (*demonstratio*). It is precisely in this inventive dimension that Llull's figures are sometimes not merely a mnemonic aid. Definitely, in this sense, Lullian Art is not in the manuscripts, in the graphic figures materially reproduced in books or in the expositions describing them, but in the mind of those who have assimilated it and reason in accordance

[34] J. Santanach "Ramon Llull i l'obscuritat que il·lumina. Apunts sobre l'origen i rendibilitat literària d'un recurs exegètic", in *Anuario de Estudios Medievales* 45,1 (2015), 331-354.

[35] Raimundus Lullus, *Ars brevis*, ed. A. Madre (CCCM 38), Turnhout 1984, 253.

with it. This is an issue about diagrammatic reasoning, an intellectual framework made for adopting visual resources and, therefore, a mental activity above all.

University of Barcelona

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Part II

Astrology & Geomancy: Visual Tools

Lunar Mansions as Celestial Images in the Thirteenth-Century *De signis astronomicis*

Arianna Dalla Costa

Introduction

The system of the mansions of the moon – or lunar stations – represents an alternative to the solar zodiac. While the latter divides into twelve sections the apparent path of the Sun (i.e., the ecliptic), lunar mansions belong to the orbit of the Moon, which is quite near to the solar ecliptic, although inclined to it by 5°, and divide it into twenty-eight sections. Just as each of the twelve sections of the solar zodiac are marked by a constellation, starting from Aries and ending with Pisces, each of the twenty-eight sections of the Moon's orbit are marked by a star or a small star cluster, to make each section easily recognisable in the night sky. This constitutes a lunar zodiac, marking the path of the Moon during its sidereal revolution around the Earth. The sections in which the Moon stays each night of its sidereal month are called mansions of the moon, while the star clusters which mark these sections are known as lunar asterisms. This system became popular in Islamic astrology from the ninth century, and a century later the first Latin translations of texts regarding lunar mansions began to circulate in Western Europe.

The origins of the mansions of the Moon, in Arabic *manāzil al-qamar,* derive from the encounter between the Indian *nakṣatras*, and the Bedouins' *anwā*, two similar systems to mark the passage of time, later assimilated together.[1] The Indians used the mansions as a division of

[1] It has also been suggested that the system of the lunar mansions originated from the Chinese *hsiu*, but this does not seem to be related to the system of the *manāzil*, which more likely developed from the Indian and Bedouin systems, as affirmed in E. Savage-Smith, *Islamicate Celestial Globes. Their History, Construction and Use* (Smithsonian Studies in History and Technology 46), Washington D.C. 1985, 119.

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the Moon's orbit into twenty-seven sections of 13° and 1/3 each, in the same way as the solar zodiac divides the ecliptic into twelve sections of 30° each. This subdivision was based on the fact that it requires twenty-seven days and 1/3 for the Moon to return to the same point of the ecliptic in relation to the same star.[2] The Bedouin system of the *anwā* was more rudimentary. The nomadic Arabs identified twenty-eight stars or groups of stars which they used to mark the twenty-eight sections into which they had divided the solar year.[3] This system was used to mark the passage of time and for meteorological predictions.[4] When the Bedouins assimilated the system of the *nakṣatras,* they associated the twenty-eight asterisms with the sections of the ecliptic through which the Moon travels during its sidereal month.[5] This hybrid system has some internal inconsistencies due to the assimilations of the two different methods, the Bedouin system is calculated on the basis of the

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Another theory that has been discarded is that of a Greek origin of lunar mansions, suggested in S. Weinstock, "Lunar Mansions and Early Calendars", in *Journal of Hellenic Studies* 49 (1949), 48-69. On the debate on the origin of lunar mansions see P. Yampolsky, "The Origin of the Twenty-eight Lunar Mansions", in *Osiris* 9 (1950), 62-83.

[2] On the origin of the *nakṣatras* see H. D. Jones, "The Origin of the 28 *Nakṣatras* in Early Indian Astronomy and Astrology", in *Indian Journal of History of Science* 53.3 (2018), 317-324. See also A. K. Bag, "Early Systems of *Nakṣatras,* Calendar and Antiquity of Vedic & Harappan Traditions, in *Indian Journal of History of Science* 50.1 (2015), 1-25; and H. Falk, "The Early Use of *Nakṣatras*" in *The Interactions of Ancient Astral Science*, ed. by D. Brown, Bremen 2018, 257-532.

[3] The number 28 itself had a strong significance in the Middle Ages: "[…] which was precious to the medieval numerologist. In classical number lore this was a perfect number, equal to the sum of its parts (7+6+5+4+3+2+1). In addition, 28 equals its half (14), plus its fourth (7), plus its seventh (4), plus its fourteenth (2), plus its twenty-eighth (1). The Ikhwān al- Ṣafā' (1957, 1, 71) noted that 28 is also the sum of the 7 planets, 9 spheres (*aflak*) and 12 zodiacal houses (*burūj*). The esoteric quality of 28 is further entrenched in the famous alchemical Geber's Square, where 28 is the sum of the numbers in the top row and right column (4+9+2+7+6). And, the number 28 became a symbol of prophethood in Islamic mysticism", in D. M. Varisco, "The Magical Significance of the Lunar Stations in the 13th Century Yemeni 'kitāb al-tabṣira fī 'ilm al-nujūm' of al-malik alashraf", in *Quaderni di Studi Arabi* 13 (1995), 19-40: 21.

[4] D. M. Varisco, "The Origin of the *anwā* in the Arabic Tradition", in *Studia Islamica* 74 (1991), 5-28.

[5] As Varisco has noticed, the belief that the *anwā* corresponded to the *manāzil* was supported by some passages of the Quran describing the Moon and the mansions. See Varisco, "The Origin of the *anwā'* in the Arabic Tradition", 14-15.

risings and settings of fixed star groups, while the *nakṣatras* relied on regular intervals of the ecliptic taken from the vernal equinox. Due to the axial precession, the lunar asterisms do not maintain the same distance from the equinoxes, which means they did not preserve the same location in the lunar mansions. The *manāzil al-qamar* became popular in Islamic astrology from the ninth century, and a century later the first Latin translations of texts regarding lunar mansions, the *Alchandreana Corpus*, began to circulate in Western Europe, employing the mansions in many typologies of prediction, such as nativities, elections, interrogations, casting lots, geomancy, in general astrology, in the making of talismans and in weather forecasting.[6] The predictions were either derived by considering in which mansion the Moon was stationing, or which mansion was rising at the horizon.

In the process of translation from Arabic into Latin, some aspects of this system became lost.[7] In particular, the meaning of some of the names of the twenty-eight mansions, which descended from the pre-Islamic names of the *anwā'* and that corresponded to Bedouin demons or constellations, was no longer intelligible,[8] making it difficult to identify the lunar star-clusters. The pre-Islamic system of constellations was very different from the Ptolemaic classification presented in the *Almagest*, which later replaced the former. The constellations recognised by the pre-Islamic Arabs on the lunar path were bigger than the twelve zodiacal constellations and the Arabic names of the mansions often referred to physical parts of the depictions of those constellations.[9] Sil-

[6] C. Burnett, "Lunar astrology. The varieties of texts using lunar mansions with emphasis on Jafar Indus", in *Il Sole e la Luna (The Sun and the Moon)* ed. A. Paravicini Bagliani (Micrologus Library 12), Firenze 2004, 43-140.

[7] An account on the difficulties encountered by European translators on Arabic material concerning lunar mansions can be found in D. Pingree, "Between the Ghāya and Picatrix. I: The Spanish Version", in *Journal of the Warburg and Courtauld Institutes* 44 (1981), 30-36.

[8] On the pre-Islamic system of constellations see E. Savage-Smith, "Celestial mapping", in *Cartography in the Traditional Islamic and South Asian Societies*, ed. J. B. Harley and D. Woodward (The History of Cartography 2,1), Chicago-London 1992, 12-70.

[9] See E. Savage-Smith, "The Most Authoritative Copy of ʿAbd al-Rahman al-Sufi's Tenth-century Guide to the Constellations'", in *'God is Beautiful; He Loves Beauty': The Object in Islamic Art and Culture*, ed. by S. Blair and J. Bloom, New Haven 2013, 122-155.

ke Ackermann convincingly suggests that the unintelligibility of the names of the mansions may also have led to the rare occurrence of pictorial representations of lunar stations, as the interpretation of the names is essential for a figurative design.[10] A further consequence is that the depictions of the lunar mansions have not yet been treated extensively in modern scholarship, although some remarkable considerations on particular aspects of this topic have been published. Silke Ackermann commented on the presence of lunar mansions on astronomical instruments;[11] Alessandro Bausani focused on some iconographical depictions of the lunar stations;[12] Emilie Savage-Smith with Marion B. Smith, and Charles Burnett have discussed the relationship between geomantic figures and the depictions of the lunar asterisms;[13] and Burnett also discussed some representations of the lunar mansions in his study on Jafar Indus.[14] The heterogeneity of Latin sources on lunar stations, their lack of astronomical information and of depictions has led to the belief that the Latins did not re-elaborate the doctrine of the mansions of the moon, but rather acquired and used a much impoverished version of it for astrological purposes, while lacking any astronomical notion about it.

The aim of this article is to highlight the astronomical and cosmological significance of lunar stations in the Latin tradition by considering the depictions of the lunar asterisms in Latin texts on the *manāzil*. In particular, my contribution to this volume looks at the Latin tradition of the mansions of the Moon that originates from the translation of the *Alchandreana Corpus*,[15] which as mentioned before is the most ancient

[10] S. Ackermann, "The Path of the Moon Engraved. Lunar Mansions on European and Islamic Scientific Instruments", in *Il Sole e la Luna*, 135-164: 145.

[11] Ackermann, "The Path of the Moon Engraved", 2004.

[12] A. Bausani, "Κήτος tra le Mansioni Lunari? Considerazioni Iconografiche sulla «Balena» a proposito di alcuni mss. dell'Età Safavide", in *Oriente Moderno*, *Anno 58*, 7,8 (1978), 275-283.

[13] E. Savage-Smith and M. B. Smith, "Islamic Geomancy and a Thirteenth-Century Divinatory Device", in *Studies in Near Eastern Culture and Society*, no. 2 (UCLA Center for Near Eastern Studies) Malibu 1980, 36-43; and C. Burnett, "Hermetic Geomancy, «Ratione Certis Experimentis Usitata»", in *Geomancy and Other Forms of Divination,* ed. A. Palazzo and I. Zavattero (Micrologus Library 87), Firenze 2017, 137-141.

[14] Burnett*, Lunar Astrology*, 2004, 79-81.

[15] The edition of the Corpus can be found in D. Juste, *Les Alchandreana primi-*

corpus of Latin texts translated from Arabic that contain information on the lunar stations, dating back to the tenth century. The main case study I have used is an anonymous astrological text entitled *De Signis Astronomicis*, found uniquely in the codex Firenze, Biblioteca Medicea Laurenziana, Plut.30.29. ff. 26ra-32ra. This text is a collection of different treatises belonging to the *Alchandreana*. The various depictions of the lunar asterisms contained in the text are used in this study as a case of 'Latinisation' of this Islamic doctrine. The aim of this study is to challenge the assumption that the Latins did not re-elaborate the doctrine of lunar mansions and that it did not hold any astronomical relevance in the West. The analysis pursued here is mainly image-based, and will consider the depictions of the lunar asterisms found in the codex Plut.30.29. The main points of discussion will be that (1) the configurations of dots that follow the description of lunar mansions are not random designs but more or less an accurate depiction of lunar asterisms; (2) secondly, the use of cosmological diagrams containing lunar mansions shows that the Latins still regarded the lunar mansions as an astronomical system and not only a divinatory tool; (3) finally, the manuscript Plut.30.29 offers the opportunity to investigate the relationship between the *manāzil* and another Arabic form of prediction, known as geomancy (*'ilm ar-raml*). The text of the *De Signis Astronomicis* is preceded in the codex by the *Estimaverunt Indi*, a famous geomantic treatise. Geomancy and the mansions of the moon do not only share the language through which they entered the West, but they both use designs of dots in their practice. The analysis of the depictions in these two texts will try to cast light on the relationship between these two doctrines.

The *De Signis Astronomicis*

Before moving to the analysis of the depictions of the *De Signis Astronomicis*, it is opportune to consider the text of this anonymous astrological treatise. The treatise is a brief astrological compilation, containing different astrological doctrines and typologies of prediction, one of them based on the mansions of the moon. This work is a collection of many of the texts forming the *Alchandreana Corpus*, namely the

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tifs: Étude sur les plus anciens traités astrologiques latins d'origine arabe (X^e siècle) (Brill's Texts and Sources in Intellectual History), Leiden-Boston 2007.

Quicumque nosse desiderat legem astrorum, the *Liber Alchandrei*, the *Benedictum sit nomen domini*, the *Liber Albandini*, the *Fragmenta Alchandreana* and the *Epistola Argafalau ad Alexandrum,* possibly along with other texts which also originated from the tenth-century astrological corpus.[16] This text has been chosen for this study as it contains several illustrations of the lunar asterisms which have not been studied before. The text is part of an interesting miscellany of magical, alchemical and astrological texts with a pronounced Arabic character.[17]

According to the editors of the *Speculum Astronomiae*, of which the manuscript contains the earliest copy, the collection is dated 1280.[18] The more recent study of Irene Zavattero suggests that the codex has been written slightly earlier, probably in the sixties of the thirteenth-century.[19] The manuscript was elaborated by a single copyist in Paris, probably from a manuscript that belonged to Richard de Fournival.[20] It comes in parchment. The dimension of the pages is of 135 mm x 170 mm and the text is organised in two columns, of 37 lines each (although the number varies slightly). The initial letters are in alternated red and blue, and capital letters are decorated in red.[21] The handwriting on the manuscript's margin annotations and the notes of ownership on f. 84r and f. 86v establish the identity of the owner of the miscellany as the humanist Marcantonio Flaminio.[22]

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[16] See Juste, *Les Alchandreana primitifs*, 310-313.

[17] On the codex Florence, Biblioteca Medicea Laurenziana, Plut. 30.29 see A. M. Bandini, *Catalogus codicum Latinorum Bibliothecae Mediceae Laurentianae sub auspiciis Petri Leopoldi,* II, Firenze 1775, 84.

[18] A. Paravicini Bagliani , *Le Speculum Astronomiae, une énigme? Enquête sur les manuscrits* (Micrologus Library 6), Firenze 2001, 22-23.

[19] I. Zavattero , "*Estimaverunt Indi*: La tradizione testuale di un anonimo trattato di geomanzia", in *Geomancy and Other Forms of Divination* ed. A. Palazzo and I. Zavattero, 31-63. Also David Pingree proposed a date previous to the 1280, dating the manuscript around 1270 in D. Pingree, "The diffusion of Arabic Magical Texts in Western Europe", in *La diffusione delle scienze islamiche nel Medio Evo Europeo. Convegno Internazionale promosso dall'Accademia Nazionale dei Lincei e dal Dipartimento di Studi Orientali*, a cura di B. Scarcia Amoretti, Roma 1987, 57-103.

[20] Pingree, "The diffusion of Arabic Magical Texts in Western Europe", 86-87.

[21] For a detailed description of the manuscript see Albertus Magnus, *Speculum Astronomiae*, ed. Caroti, M. Pereira, S. Zamponi, dir. P. Zambelli (Domus Galinaeana, Quaderni di storia e critica della scienza), Pisa 1977, 130-132.

[22] Bandini, *Catalogus codicum, II*, 86: "[…] unde M. Ant. Flaminius qui fuit pos-

The material on the mansions of the moon contained in the *De Signis Astronomicis* consists in (1) a preliminary list of the twelve zodiacal signs and the mansions they contain (f. 26va):

> So there are signs distributed in some parts, which are marked by the Moon. And it is said that her houses, or mansions, are as follows, and they will be necessary for the science of all aspects of mathematics. Therefore, the Moon traverses the twelve signs every lunar month [and] twenty-eight zodiacal mansions that she crosses in twenty-seven days and a half, which is one lunacy. Here are the names of those parts or mansions in the single signs in this way: The first, Aries, has two mansions in its region, *anatha* and *albothan*, and a third part of *athurie*. The second, Taurus, has two parts of *athurie* and *adoran*, and two parts of *almisan*. The third, Gemini, has the third part of that, and *altachiam* and *adrian*. The fourth, Cancer has *alnatram* and *altarfiam*, and a third [part] of *alzuha*. The fifth, Leo, has two of that, and *alcoratem* and two [parts] of *azarfa*. The sixth, Virgo, has the third [part] of it, and *alauha* and *assemeth*. The seventh, Libra, has *algafar* and *alzamenin* and a third [part] of *alchalel*. The eighth, Scorpio, has two of that, and *altheip*, and two [parts] of *aleura*. The ninth, Sagittarius, has the third part of *aleura*, and *alnohan* and *albeida*. The tenth, Capricorn, has *adadoriath* and *zaabola*, and the third [part] of *adazoth*. The eleventh, Aquarius, has two parts of that and *zadelcaima*, and two [parts] of *peragalachir*. The twelfth, Pisces, has two parts of that, *peragalachir* and *albotan*.[23]

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sessor codicis manus in calce adnotavit: *deest.* […] cum notulis M. Ant. Flaminii, qui se Graece subscripsit pag. 83 et latine in ultima pagina." On the possessor of this miscellany see also Zavattero, "*Estimaverunt Indi*: La tradizione testuale di un anonimo trattato di geomanzia", 55-58.

[23] Firenze, BML, Plut. 30.29, f.26va: "Sunt autem singula signa per quasdam partes distributa que per lunam designatur. Et eius hospicia, uel mansiones, dicuntur quorum omnium scientiam ad mathematicorum rationes sequentes erit necessaria. Luna igitur per 12 signa in una quaque lunatione metitur, 28 zodiactea hospicia que pertranssit in diebus 27 et dimidio, que est lunatiam unam. Partium illarum, seu hospiciorum, nomina in singulis signis sunt ita: 1m Aries habet duas mansiones in sua regione, anatha et albothan, et terciam partem athurie. 2m Taurus habet duas partes athurie et adoran et duas partes almisan. 3m Gemini habent terciam partem huius, et altachiam et adriam. 4m Cancer habet alnatram et altarfiam, et terciam alzuha. 5m Leo duas huius habet, et alcoratem, et duas azarfa. 6m Virgo terciam habet huius, et alauha, et assemeth. 7m Libra habet algafar, et alzamenin, et tercia alchalel. 8m Scorpius habet 2as huius, et altheip, et duas aleura. 9m Sagitarius habet terciam partem aleura, et alnohan, et albeida. 10m Capricornus habet adadoriath, et zaabola, et terciam adazoth. 11m Aquarius habet duas partes huius, et zadelcaima, et duas peragalachir. 12m Piscis terciam partem habet huius, et duas peragalachir, et albotan."

(2) (ff. 26vb-28ra) and a description of the features of each mansion for the purpose of making a nativity prediction, based on the rising of the mansions in the sky. Starting with the name of each mansion, its position in the zodiac, the number of stars which compose the asterism and its image (represented as asterisks in the passage that follows), the treatise then proceeds to give the astrological information for the prediction:

> *Almisan* is the end of Taurus and the head of Gemini, two stars **. Who is born in it will be neither white nor black, of equal shape, medium face, beautiful hair, of elegant body, tamed, industrious, a mediator of others' businesses and strong in possessions. *Arathia*, or *azothaia*, [is] the venter of Gemini, five stars as such *****. Who is born in it is handsome in face and body, but with black hair. It means a wound on the face, a great voice. He will have two wives, and they will not survive. *Aldaraha*, or *aldrian*, is the end of Gemini, two stars as such **. Who is born in it will be white and sometimes yellow, of strong anger, passionate, prone to evil and to false oath, he does not love his wife, sighing. He perceives a lot before it happens publicly, [he will be] daring in front of emperors. He will die by sword.[24]

(3) Finally, the text contains a circular diagram that associates the zodiacal signs and their qualities with the names and asterisms of the lunar mansions, which will be discussed later (f. 27r).

Apart from the material regarding lunar mansions, the *De Signis Astronomicis* offers indications for the practice of different typologies of prediction and astronomical notions, such as aspects of the planets, their domicile, exaltation and fall, a list of the twelve signs, with the aspects of the planets in each of them, and their characteristics (ff.29ra-29rb), an explanation on the planets and lunar nodes featuring the planetary longitude and the time each planet takes to run through the zodiac and their natural qualities (ff. 29va-29va), a method of prediction based on the presence of fortunate or unfortunate stars in the twelve astrological houses (ff. 29va-30ra), a section on the forecast based on

[24] Firenze, BML, Plut. 30.29, f.26vb: "Almisan finis est tauri et capud geminorum, stelle due **. Qui in eis nascitur nec albus nec niger, forma equalis, facie medius, capillis pulcher, corpore mundo, mansuetus, sedulus, mediator de aliorum negociis, et possessionibus fortis. Arathia, uel azothaia, uenter geminorum, stelle 5 sic *****. Qui nascitur in hiis, formosus est facie et corpore, sed capilli nigris. Significat plagam in facie, vocem magnam. Duas uxores habebit, et non uiuent. Aldaraha, uel aldrian, finis est geminorum, stelle due sic **. Qui in hiis nascitur erit albus et aliquociens melinus, fortis ire, libidinosus, pronus ad mala et ad periuriam, non diliget propriam uxorem, suspirosus. Multa percipiet antequam in publicum ueniant, audax ante faciem principum. Morietur gladio."

the planetary hour in different lists and combinations and their use in nativities (ff. 30ra-31ra), the text then offers the description of interrogations according to the planetary hours, with a ternary division of each hour (ff. 31ra-31va), the prediction concerned with who will die first between husband and wife, made according to the nature of the zodiacal signs and also from the remainder of the division of the number of an individual's name (f. 31vb), another section is dedicated to the outcome of diseases based on the division for three of the numeric values of a name and according to the planetary hours (f. 31vb). This material will not be examined in this article, which is uniquely concerned with the mansions of the moon.

The identification of the lunar asterisms

The first issue that this study wants to address is that of the identification of the lunar asterisms. There are many studies cataloguing the names of the mansions and listing the stars that form the asterisms, such as those compiled by Philip Yampolsky,[25] Emilie Savage-Smith[26] and Daniel Martin Varisco.[27] All these lists are very similar, not only because the names of the mansions are the same, but because the identification of the asterisms is consistent in the different sources they consider, as they all refer to the Islamic tradition. No attempt has been made to investigate whether the Latins used the same stars to mark the mansions of the moon in the night sky. This matter has been dismissed due to the assumption that the system of the mansions of the moon in the Latin world had lost its astronomical elements, and that the patterns of dots that follow the description of the asterisms in Latin medieval manuscripts had little to do with actual star clusters.[28] It is certainly true that the Latin literature on lunar stations is extremely heterogeneous; it is difficult to find two identical lists with the names of the mansions,[29]

[25] Yampolsky, "The Origin of the Twenty-eight Lunar Mansions", 62-83.

[26] Savage-Smith, *Islamicate Celestial Globes*, 121-132.

[27] Varisco, "The Magical Significance of the Lunar Stations in the 13th Century Yemeni "Kitāb al-Tabṣira Fī 'Ilm al-Nujūm" of al-Malik al-Ashraf", 19-40 and D. M. Varisco, "Lunar Mansions and Timekeeping in Western Islam", in *Suhayl* 8 (2008), 121-161.

[28] Savage-Smith, *Islamicate Celestial Globes,* 121.

[29] See Juste, *Les Alchandreana primitifs*, 2007, 657-665. Juste's tables register all the variations in the names of the lunar mansions in the texts of the *Alchandreana*.

and that the astronomical system of the lunar zodiac was to a certain extent obscure to the Latins. In fact, often for the nativity prediction based on the lunar stations, the mansion rising at the horizon was not found observing the heavens or by astronomical calculations, but rather derived from the numerical value of the letters of someone's name. Nevertheless, I aim to demonstrate that the patterns of dots found in Latin sources on the mansions are not random designs, but representations of the lunar asterisms, and a correspondence can be found between these and actual star clusters. As such, using the information supplied in the *De Signis Astronomicis*, I have attempted to identify the lunar asterisms; the result suggests that still in the 13th century, the Latin tradition on lunar mansions was referring to actual star clusters for its predictions. For identifying the star-clusters I have considered the vague indications supplied in the *De Signis Astronomicis* on the location of the lunar asterisms, namely, the shape of the dot pattern and the position of the star-clusters, indicated with the corresponding part of the zodiacal constellations.

Some general tendencies can be observed in the way which these asterisms differ from the traditional Arabic ones. A first difference regards the number of stars forming the asterisms, definitely more numerous in the Latin tradition. In some cases, the text indicates clusters that are impossible to identify, such as in the case of mansion 28, which in the Arabic tradition is represented by a single star, in the Florence manuscript is represented with an asterism of 20 stars, impossible to find in that area of the sky. But in most cases, the addition of stars is more moderate and follows a specific scheme: that of including to the original star or cluster the brightest stars which are closer to it. This happens for example in the case of the first mansion, where γ Librae is added to α and β Librae, since it is the brightest star near to them. Another case is that of mansion 4, traditionally identified with α Tauri, the brightest star of the constellation, also known as Aldebaran. In the Latin tradition, this mansion is not marked by a single star but by a V-shaped cluster. This suggests that to α Tauri the Latins added the Hyades, the open cluster that surrounds Aldebaran. Adding these stars to the original clusters may have helped to make their shape easier to recognise in the night sky.[30]

[30] This is not the only occurrence of the Hyades in the fourth mansion, another example preserved both in Arabic and Latin is that of the *De Imaginibus Caelestibus*

Another observation concerns the dimension of the stars included in the asterisms. The Indian-Bedouin tradition considers stars among the brightest in the sky as part of mansions of the moon. The identification pursued from the *De Signis Astronomicis* offers a more varied selection of stars. This depends both on the fact that the Latin lunar mansions seem to include more stars, often those surrounding the original asterisms. An example of this diversity is represented by the inclusion of M44 in the eighth mansion, where γ δ η Cancri form a triangle that contains it. This Messier object, also known as *Praesepe*, is an open cluster in the constellation of the Cancer; it has been known from the ancient times, as it is visible to the naked eye like a small nebulous object, known in the Almagest as "the nebulous mass in the chest [of Cancer]".[31] Another text suggesting the inclusion of M44 in the eighth asterism in the Latin tradition is the *Tractatus pluviarum et aeris mutationis* by Johannes Hispalensis, in which the author describes the mansion as such: "The eighth is called *Nebulosam*, and they are two stars with a nube in the middle."[32] Another factor showing the astronomical character that lunar mansions preserve in the Latin tradition is the identity of the Arabic asterisms with those found in Latin sources. An example of that is the third mansion, traditionally identified with the open cluster of the Pleiades, also known as M45. This is represented in the *De Signis Astronomicis* as an asterism of seven or eight stars po-

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attributed to a certain Ibn al-Hātim and translated into Latin by Guglielmo Raimondo de Moncada, a text in which lunar mansions are employed for the creation of talismans. The fourth mansion is described as such in the manuscript Vaticano, Urb. Lat. 1384, f.8ra: "oculus tauri vocatur ildabran, est una stella rubea cum qua sunt alie stelle parve." On folio 8v the image referring to this mansion displays a big dark-red star adjacent to a cluster of smaller stars shaped like a hook. For further information on this text see K. Lippincott and D. Pingree, "Ibn al-Hātim on the Talismans of the Lunar Mansions", in *Journal of the Warburg and Courtauld Institutes* 50 (1987), 57-81; and M. Oliveras, "El *De imaginibus caelestibus* de Ibn al- Ḥātim", in *al-Qanṭara* 33,1 (2009), 171-220.

[31] Claudius Ptolemaeus, *Almagestum*, VII 5, trans. by G. J. Toomer, London 1984, 366.

[32] C. Burnett, "Weather Forecasting, Lunar Mansions and a Disputed Attribution: the *Tractatus Pluviarum et aeris mutationis* and *Epitome totius astrologiae* of 'Iohannes Hispalensis'", in *Islamic Thought in the Middle Ages*, ed. by A. Akasoy and W. Raven (Islamic Philosophy, Theology and Science. Texts and Studies), Leiden-Boston 2008, 219-265: 250: "Octavam dicunt Nebulosam, suntque sydera duo cum nube media […]."

sitioned in two lines, a shape that clearly recalls those among the stars of M45 that more clearly can be gazed by the naked eye. Beyond this example, many other asterisms keep the same number of stars of the traditional mansions. Finally, it must be noticed that between the two lists of representations of the asterisms in the ms. Plut. 30.29, one in the text and other in the diagram, there is a strong correspondence, this is a final point in favour of the thesis that these configurations of dots were not drawn randomly, although there are some major inconsistencies between the Arabic and Latin traditions. A major discrepancy regards the twenty-first mansion, *al-balda*, which is traditionally identified with a vacant space, as it corresponds to a section of the constellation of Sagittarius in which there are no stars. It appears that the texts of the *Alchandreana* and those originating from them do attribute an asterism to this mansion too. The *De Signis Astronomicis* places there seven stars, which are impossible to identify in that area. In his study on a Greek text on lunar mansions (*Codex Cromwellianus*), Stefan Weinstock comes across the identification of the twenty-first mansion with an asterism of twelve stars. His explanation for this is that this mansion could have served for the astronomical identification of the 'celestial city', a pagan prototype of the heavenly Jerusalem of the Apocalypse (c.21). Weinstock supports this position by mentioning that the city is situated in the Milky Way, and that the twelve stars would suit the arithmetical speculations of the Apocalypse, which mentions twelve gates, twelve angels, twelve gems and so on.[33] This theory remains a speculation, but it can suggest why there is a tradition that, instead of identifying *al-balda* with a blank space, it positions an asterism in it too.

[33] S. Weinstock, "Lunar Mansions and Early Calendars", in *The Journal of Hellenic Studies* 69 (1949), 48-69: 50-51.

The Diagram

Fig. 1. Firenze, Biblioteca Medicea Laurenziana, Ms. Plut. 30.29, f. 27r. The diagram, with the circle at the centre representing the Earth, shows the association of the twelve zodiacal signs and the twenty-eight asterisms of the lunar mansions. (This image is reproduced with permission from the Biblioteca Medicea Laurenziana).

As mentioned before, on f. 27r the *De Signis Astronomicis* contains a circular diagram occupying the whole page, which constitutes the largest image of the whole miscellany. The diagram represents the association between the solar zodiac and twenty-eight lunar mansions. The outer band of the image is divided into twelve sections which contain the names of the zodiacal signs, starting with Aries at the top of the circle. The next band, also divided into twelve sections, contains a brief description of the planetary characteristics of the signs and their nature, for example, under Aries, the text reports: "Ascendant of the Sun, descendant of Saturn, domicile of Mars, affliction of Venus. An Eastern sign".[34] This is followed by another band, divided into twenty-eight portions containing the patterns of dots that stand for the lunar

[34] Firenze, BML, Ms. Plut. 30.29., f. 29r : "Erectio solis, descensio saturni, mansio martis, mesticia ueneris, signum orientale".

asterisms, and next comes the band with the twenty-eight names of the *manāzil*. At the centre of the diagram, there is a circle with the letters "TERR", missing an "A" to spell "Terra", surrounded by a band containing the letters "AER". The reading direction of all the sections of the diagram proceeds clockwise, and the reader must turn the codex to be able to read each section. As mentioned before, this representation has not been examined before, but this diagram, more than others, offers a case for showing how the astronomical relevance of lunar stations in Latin culture did not completely disappear. To start with, this image gives the reader a point of view that is not given by the astronomical observation from the Earth, firstly because not all the constellations can be observed at the same moment, but, most importantly, because the diagram displays the two different systems of division of the ecliptic in two different bands, to show the correspondence between the lunar and the solar zodiac, while in reality zodiacal constellations and lunar asterisms would have both been part of the sphere of the fixed stars, and they are often composed of the same stars. The juxtaposition of the two bands allows the reader to see the correspondence between these two divisions of the ecliptic, with each sign of the zodiac containing two mansions and a third, as expressed in the text. Since the inscriptions in the diagram are written clockwise, the circular motion becomes an inner feature of the diagram, that works similarly to a *rota,* as the page must rotated around – or the reader must turn around.

A similar image from the *Alchandreana* is found in the manuscript Paris, Bibliothèque nationale de France, lat. 17868, f. 16v.[35] What is different between these two pictures is that the circular diagram from the Paris codex does not express the correspondence of the inner circle with the Earth, as this is filled with the design of a flower. Another difference is that this diagram must be read proceeding anticlockwise. The Paris diagram also contains a band with the signs of the zodiac, and in addition it also adds a band with the letter of the alphabet. Moreover, as Burnett has already noticed, mansion 24 is omitted by mistake. So this second diagram does not seem to be aiming to represent the cosmos as clearly as the diagram of the *De Signis Astronomicis* does. Of course, this type of image stands in a wider diagrammatical tradition. The circular design was very popular in medieval astronomy and astrology, and was often adopted to represent lunar mansions,

[35] The diagram can be seen in Burnett, "Lunar Astrology", 2004, Fig. 1,

for the shape of a circle has a strong cosmological significance, and the device of a concentrically divided circle recalls the structure of the medieval cosmos. On the other hand, the radially divided circle suits the representations of calendars and lunar or solar cycles, as it expresses the cyclic nature of the celestial motions. The diagram in the *De Signis Astronomicis*, which combines these two divisions, merges the cyclical nature of the rising and setting of the lunar mansions and the path of the Moon with the cosmological character of the concentric circles, with the Earth at the centre. Moreover, by representing the solar and the lunar zodiacs combined, the diagram reinforces the idea of a correspondence between the lunar and solar zodiac, while also representing a tool that helps the reader in the astronomical observation of the lunar mansions.[36]

Because this diagram of the lunar stations clearly expresses the correspondence of the inner circle with the Earth, it represents, if not an accurate celestial map, at least a tool to understand these two astronomical systems in their cosmological background. According to Wolfgang Metzger, there are only a few medieval manuscripts that display precise 'star maps', while in the majority of cases these representations must be seen more as a visualization of the text they illustrate.[37] The diagram in the Firenze codex cannot be considered as an accurate star chart. Yet, despite the headline on top of the diagram that says "this figure is a description of what is written above",[38] it is wrong to reduce it to a mere visual exposition of what is exposed in the text. In fact, the text of the *De Signis Astronomicis* does not properly introduce the topic of lunar mansions and how they can be observed from Earth. It is the diagram that offers the reader an astronomical perspective on this doctrine. It gives the reader a point of view which is not given by the astronomical observation, while at the same time it helps to recognise the star-clusters that mark the man-

[36] On the use of circular diagrams divided both radially and concentrically see M. W. Evans, "The Geometry of the Mind", in *Architectural Association Quarterly* 12.4 (1980), 32-55.

[37] W. Metzger, "Stars, Manuscripts and Astrolabes - The Stellar Constellations in a Group of Medieval Manuscripts between Latin Literature and a New Science of the Stars", in *The Inspiration of Astronomical Phenomena VI*, ed. E. M. Corsini, (ASP Conference Series 441) San Francisco 2011, 540-41.

[38] Firenze, BML, Plut. 30.29., f. 27r: "supradictorum descriptio hec est figura".

sions of the moon. By displaying in the same image the two different systems of division of the ecliptic, – that into twelve sections of 30˚ and that of twenty-eight sections of more or less 12˚8' – the text highlights the astronomical significance rather than the astrological value of this doctrine. This suggests that the astronomical aspect of this system was not lost completely in the Latin tradition.

Lunar asterisms and geomantic images

A final reflection on the images in the *De Signis Astronimicis* engages with the context of the manuscript Plut. 30.29. This miscellany contains several works, of which only two are illustrated: the astrological treatise discussed in this paper and the work that precedes it in the miscellany, a geomantic treatise known as *Estimaverunt Indi* (ff. 1ra-25vb).[39] The closeness of these two works is interesting, considering the relationship between geomancy and lunar mansions. Geomancy is a divinatory practice that derives its forecast from a set of sixteen figures made of a maximum of eight and a minimum of four dots. These patterns, to which are attributed several astrological qualities (i.e. good or bad fortune, gender, colour, direction, etc.), are placed in the twelve zodiacal houses and the prediction considers the value of a geomantic image according to the house in which it is placed.[40] In addition to the fact that both these methods of prediction are known in the West uniquely thanks to translation from Arabic and are therefore not ascribed to the Greek-Latin astrological corpus,[41] medieval authors have sometimes

[39] On the *Estimaverunt Indi* see A. Palazzo, "L'*Estimaverunt Indi* e la condanna del 1277", in *Geomancy and Other Forms of Divination*, 167-221 and Zavattero, "*Estimaverunt Indi*: La tradizione testuale di un anonimo trattato di geomanzia", in *Geomancy and Other Forms of Divination*, 31-63. The critical edition of this text is currently being prepared by Alessandro Palazzo.

[40] On the method of the geomantic forecast see T. Charmasson, "La Géomancie Médiévale. Les Traités et leur Diffusion", in *In Geomancy and Other Forms of Divination*, 5-29

[41] On the origins of geomancy see P. Tannery, "Le Rabolion, Traités de Géomancie Arabes, Grecs et Latins", in *Mémoires Scientifiques*, vol. IV, Tolouse-Paris 1920, 299-317; F. Klein-Franke, "The Geomancy of Ahmad G. 'Alī Zunbul. A Study of the Arabic Corpus Hermeticum", in *Journal of the Society for the Study of Alchemy and Early Chemistry* 20 (1973), 26-35; Savage-Smith and Smith, "Islamic Geomancy and a Thirteenth-Century Divinatory Device", 1-5; Skinner, *Geomancy in Theory and Practice*, Singapore 2011, 51-78; T. Charmasson, *Recherces sur une Technique*

asserted the correspondence between the geomantic figures and the asterisms of the lunar mansions.[42] Despite the fact that the geomantic forecast did not require any astronomical observation nor the use of instruments or tables to calculate the celestial situation, geomancy was sometimes referred to as *astrologia brevis*, a shorter form of astrology.[43] The link with astrology lays in the paradigm of dependence of the terrestrial world to the superior one. In the act of drawing the geomantic figures, the geomancer was believed to be acting as an instrument of the celestial bodies. As such, the designs of dots that he drew were believed to represent the astral configurations present in the sky at the moment of the prognostication. In particular, geomantic figures would represent the asterisms of the mansions of the moon.

Divinatoire: la Géomancie dans l'Occident Médiéval, Geneve 1980, 72-83; M. Melvin-Koushki, "Geomancy in the Islamic World", in *Prognostication in The Medieval World, a Handbook*, Vol. 2, ed. M. Heiduk, K. Herbers and H. C. Lehner, Berlin 2021, 789-793.

[42] Hugo Sanctelliensis, *Ars geomantiae*, Paris, Bibliothèque Nationale de France, lat. 7354. The prologue of the text is available in P. Arfé, "Le dimore delle stelle nel *Prologus super Artem geomantiae* di Ugo di Santalla", in *Studi Magrebini*12-13,1 (2012), 41-71), prologue: "All professors of philosophy have considered it definite and confirmed that everything established and dwelling in this world has a matching exemplar in the higher sphere, and that everything agitated by any motion here below imitates the related movements of the higher region. Thus it is clear that figures of the kind that we wish to deal with here, completely follow the forms of both the signs and the lunar mansions. […] Thus the oldest authorities of this discipline, choosing the signs of the zodiac from the large number of constellations, and taking their beginning from Aries, produced figures of this kind wherever they are formed. Thus *comprehensum intus* is generated from those (forms) which are *anathet* and *abuten* etc." Here *Comprehensum intus*, which is the name of one of the geomantic figures, is said to originate from two of the mansions of the moon. The translation of this passage is taken from Burnett, "Hermetic Geomancy", 2017, 137. On the *Ars geomantiae* see P. Arfé, "Attorno all'edizione dell'*Ars geomantiae*. Le fonti esplicite e implicite", in *Quaestio 19. Stars, Kingdoms, Beliefs, and Masses. Political Astrology in the Mediterranean Area from Middle Ages to the Renaissance (Le stelle, i regni, le credenze e le masse: l'astrologia politica nel Mediterraneo fra Medioevo e Rinascimento)*, ed. M. Benedetto, P. Arfé and P. Porro. Turnhout 2020, 101-128. Of the same author: "L'*Ars Geomantiae* di Ugo di Santalla: il testo e la sua tradizione", in *Geomancy and other Forms of Divination*, 65-92..

[43] Bartolomaeus Parmensis, *Breviloquium artis geomantiae*, quoted in Charmasson, *Recherches sur une technique divinatoire* (1980), 14. On Bartolomaeus Parmensis please see also A. Beccarisi, "Qualche considerazione sulla *Geomantia* attribuita a Guglielmo di Moerbeke", in *Quaderni di noctua* 5-15 (2019), 554-603.

Although this link is expressed in early Latin sources on geomancy, we do not know of any geomantic treatise that employs lunar mansions to make the prediction. The texts of the *Estimaverunt Indi* and the *De Signis Astronomicis* do not contain any cross-reference to each other. Nevertheless, their proximity in the manuscript remains relevant, if not from a textual point of view, from a visual one. The similarity between the patterns of dots representing the lunar asterisms and the geomantic figures is in some cases easily recognisable, as the number of dots and the shape correspond. Both lunar asterisms and the figures in the *Estimaverunt Indi* are represented in circular diagrams and also as single patterns of dots in the text.[44] This affinity of the way in which these designs are displayed represents another visual link between these images. Nevertheless, in Plut.30.29, while the asterisms are drawn as dots, made by a single sign of ink on the parchment, the geomantic figures are represented as little circles. This way of representing the asterisms and the geomantic images is not a constant: some manuscripts adopt the little circles to represent the stars in the asterisms,[45] and geomantic figures can be represented as small dots.[46] Lastly, both the geomantic figures and the mansions of the moon are sometimes represented as small stars.[47] As the whole the miscellany has been written and illustrated by the same copyist, the choice to represent the dots differently in the two texts may indicate the attempt to mark the distinction between them. Yet, the closeness of these two texts, how the configurations of dots are displayed and the medieval belief of a correlation between lunar asterisms and geomantic figures are all factors that the medieval reader would have considered when faced with this manuscript.

Finally, it is interesting that among all the astrological doctrines exposed in the *De Signis Astronomicis*, only that of the lunar man-

[44] The circular diagram containing geomantic figures in the *Estimaverunt Indi* has been reproduced in Zavattero, "*Estimaverunt Indi*: La tradizione testuale di un anonimo trattato di geomanzia", 49.

[45] Paris, Bibliothèque Nationale de France, lat. 7316A, f. 46v, in Burnett, *Lunar Astrology*, Figure 6a. In this case, however, the circles are coloured in.

[46] In Firenze, Biblioteca Riccardiana, cod. 829, ff. 43ra-76vb, which contain another copy of the *Estimaverunt Indi*, geomantic images are represented both as small circles and as dots.

[47] For the geomantic figures see London, British Library, Arundel 66, f. 269ra-277rb, and for the lunar mansions Cambridge, Corpus Christi College, MS 037, ff. 52r-61r.

sions is enriched by a visual representation of it, while if we consider the whole miscellany, lunar mansions and geomancy are the only two doctrines that have been illustrated. This could indicate a certain insecurity in dealing with this new knowledge, which the Latin world had only recently inherited, for which adding a visual element might have helped the reader understand these new practices. Geometrical designs and diagrams were used in the Middle Ages to help mentally visualise the cosmos, in its structure as well as in its motion.[48] The circular diagrams of the *De Signis Astronomicis* and the *Estimaverunt Indi* could have had a didactic function for the medieval reader, as 'informational images'[49] of the structure and functioning of these new astronomical and divinatory doctrines. Indeed the importance of visual objects in any intellectual process was a fundamental concept in the late medieval period, as testified in Aristotle's philosophy, which was regarded as an essential instrument to study nature.[50]

Conclusions

The analysis pursued in this article highlights the importance of considering the diagrammatical representations found in astrological texts. In many cases these images are not mere visual exemplifications of what the text they follow already expresses, but add new perspectives to it. In the case of the *De Signis Astronomicis*, the diagram on f. 27r offers a point of view which is not given in the text, helping the reader to better understand the context in which the doctrine of the mansions of the moon operates. It also helps the historian to shed light on the extent to which the Latins still knew and understood the astronomical notions on the basis of the system of mansions of the moon. The diagram clarifies the relationship between the two divisions of the ecliptic, that into twelve sections of the solar zodiac, and that of twenty-eight mansions, and how these two systems are related to each other, as well as displaying the relationship between Earth and the celestial sphere in which the

[48] See K. M. Crowther and P. Barker, "Training the Intelligent Eye. Understanding Illustrations in Early Modern Astronomy Texts", in *Isis* 104, 3 (2013), 470.

[49] I use the expression as intended in J. Elkins, "Art History and Images that are not Art", in *The Domain of Images,* London 1999, 3-12.

[50] Aristoteles, *Metaphysica* 1.1, in *The Basic Works of Aristotle,* ed. R. McKeon, trans. W. D. Ross, New York 1941, 689.

lunar mansions are placed. As such, this image can be considered, if not an accurate star map, definitely a useful tool for the reader, showing the *manāzil* and their place in the medieval cosmos.

Moreover, the study of the representation of the lunar asterisms has revealed a correspondence of these with actual star clusters. A clear identification based on these images is, of course, not always possible. The astronomical indications given by the text are not precise, and the representation of the asterisms is also unable to offer some precious details: the dimension of the dots is always the same, which does not allow one to derive the different magnitude of the stars they include; secondly, while the configurations of dots often recall the shape of the asterisms, it is difficult to understand the distance between these stars. Despite their inaccuracies, these representations are not random designs; they stand for actual asterisms and they may have helped astrologers to recognise the lunar mansions in the night sky. The possibility to identify the lunar asterisms from the information supplied in the *De Signis Astronomicis* indicates that still in the thirteenth century the Latins were referring to some of the asterisms of the *anwā'* tradition, although in some cases they modified them, including stars that were not enumerated in the traditional mansions. Finally, by considering the whole miscellany in which the *De Signis Astronomicis* is contained, it is possible to understand how the medieval reader might have interpreted the similarity between lunar asterisms and geomantic images. While the *Estimaverunt Indi* and the text considered in this study are not related, and ms. Plut. 30.29 is the only occurrence in which they are adjacent, images have the ability to link different disciplines and traditions, and from a visual point of view the reader can gather the connection between these two types of images. This highlights the relevance of considering medieval texts in the broader context of the collections in which they are found, and that the proximity to another text may not be coincidental. This brief article has focused on a single diagram in a single manuscript and therefore provides a very limited analysis, a comprehensive study on the various forms of representations of lunar mansions, both in the Arabic and Latin tradition remains a *desideratum*.

Warburg Institute, University of London

Et ego quidem nunc fabricabo circulum
Images and Diagrams in the Geomantic Treatise *Estimaverunt Indi*

Alessandro Palazzo

Introduction

The *Estimaverunt Indi* is one of the earliest geomantic treatises from the Latin Middle Ages. It is clearly a Latin translation of a lost Arabic original. The text, of which I am currently preparing an edition, has recently sparked scholarly interest for being the only work, besides Andrea Cappellanus' *De amore*, to have been targeted by the condemnation issued by the Bishop Étienne Tempier in 1277.[1] Some recent essays have focused on the manuscript tradition of the *EI*,[2] supplementing, revising, and updating Paul Tannery's and Thérèse Charmasson's classic studies.[3]

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[1] A. Palazzo, "L'*Estimaverunt Indi* e la condanna del 1277", in *Geomancy and Other Forms of Divination,* ed. A. Palazzo, I. Zavattero, Firenze 2017 (Micrologus Library 87), 167-221; Id., "Geomancy as a Paradigm of Operative Rationality in the Middle Ages", in *Archiv für mittelalterliche Philosophie und Kultur* 21 (2015), 55-74 (66-73).

[2] The work is preserved in full in four manuscripts: Aix-en-Provence, Bibliothèque Municipale, ms. 1298, 1-96v [= *A*]; Firenze, Biblioteca Medicea Laurenziana, Plut. XXX.29, 1ra-24ra [= *Fl*]; Firenze, Biblioteca Nazionale, Magliabechiano XX,9, 1ra-19va [= *Fm*]; Firenze, Biblioteca Riccardiana, cod. 829, 43ra-76vb [= *Fr*]. Another four manuscripts only contain fragments: Erfurt, Universitätsbibliothek, Universitäts- und Forschungsbibliothek, Erfurt-Gotha, Amplon. 4° 365, 53-82 [= *E*]; Firenze, Biblioteca nazionale, Palat. 945, 239ra-252vb [= *Fp*]; London, British Library, Harley 4166, 1-12 [= *L*]; München, Bayerische Staatsbibliothek, Clm 547, 86r-159r [= *M*]. On the manuscript tradition, see Palazzo, "L'*Estimaverunt Indi*", 189-193; I. Zavattero, "*Estimaverunt Indi*: la tradizione testuale di un anonimo trattato di geomanzia", in *Geomancy and Other Forms of Divination*, 31-63 (35-37).

[3] P. Tannery, "Le Rabolion" II. "L'introduction de la géomancie en Occident et le traducteur Hugo Sancelliensis", in *Mémoires Scientifiques*, publiés par J. L. Hei-

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In this paper, my aim is to analyse this important geomantic treatise insofar as it contains images, diagrams, and other visual tools to instruct the reader in the performance of the geomantic technique. In other words, I intend to explore the meaning of this treatise from the perspective of "visual knowledge". If we look at it from this point of view, the text, as we shall see, has distinctive traits that make it stand out within Latin geomantic literature.

Therefore, after giving some essential information on geomancy and briefly describing the geomantic procedure, my paper will explore three specific aspects of the *EI*. In so doing, it will challenge a few claims in scholarly literature that do not do justice to the complexity of the text and are probably due to the lack of a critical edition (the text has so far been available only in manuscripts or through partial and provisional transcriptions).

It has been argued that the *EI* lacks a description of the geomantic procedure, because it assumes the method is already known by the reader; the text is therefore believed to be addressed to the experienced geomancer. Moreover, it has been pointed out that the *EI* does not have a systematic structure, that it proceeds without an orderly plan and discusses the same subjects several times. Finally, some scholars have emphasized that the text has nothing or little to do with astrology, while all other geomantic treatises explicitly theorize this connection and introduce astrological elements into their analysis.[4]

BERG, vol. IV, Toulouse–Paris 1920, 297-373 (339-344); TH. CHARMASSON, *Recherches sur une technique divinatoire: la géomancie dans l'Occident médiéval*, Geneve–Paris 1980, 111-119.

[4] CHARMASSON, *Recherches sur une technique divinatoire*, 116: "Le procédé de formation du thème n'est past lui-même exposé. L'auteur suppose en fait connues les bases de la géomancie. En outre, le traité reprend plusieurs fois les mêmes notions, sans ordre apparent […]"; EAD., "Les premiers traités latins de géomancie", *Cahiers de civiliation médiévale* 21 (1978), 121-36 (135); ZAVATTERO, "*Estimaverunt Indi*: la tradizione testuale", 40-41: "[…] né descrive il rapporto di tale tecnica con l'astrologia, né spiega la formazione del tema geomantico. […] si rivolge a un geomante già istruito circa le modalità di procedere della tecnica divinatoria, offrendo soltanto indicazioni generali." For all these reasons, I. ZAVATTERO, "*Estimaverunt Indi*: la diffusion d'un texte geomantique condamné", in *Medioevo. Rivista di filosofia medievale* 42 (2017), 57-80 (61-62), characterizes the *EI* not as a treatise but as a *vademecum* containing the rules of the geomantic technique.

Geomancy: The Origin and the Name

Geomancy was one of the most renowned divinatory arts practiced in the Middle Ages.[5] From Arab North Africa, where it is believed to have originated, it reached the Latin World in the twelfth century via translations of a few Arabic treatises. As said above, the *EI* is considered to be one of the earliest geomantic Arabic-to-Latin translations. From the twelfth century onward, a profusion of Western literature on geomancy appeared (including not only Arabic-to-Latin translations, but also Hebrew-to-Latin ones, Latin treatises, sections on geomancy within theological and philosophical works, and innumerable vernacular testimonies of different kinds). The geomantic method eventually became a controversial subject, researched by some of the most prominent scholars of the Late Middle Ages (e.g., Albert the Great, Bonaventure, Thomas Aquinas, Siger of Brabant, Peter of Padua, etc.) within the context of the debate on divination, its epistemological status, and its orthodoxy. Specific condemnations targeted the geomantic technique, the most famous being a 1277 syllabus by the Bishop Étienne Tempier.[6]

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[5] The cross-cultural relevance of this form of divination is borne out by its dissemination across all medieval societies. Recent studies of non-Latin geomancies include B. Villuendas Sabaté, *La geomancia en los manuscritos judeo-árabes de la Gueniza de El Cairo*, Córdoba 2012, and some of the contributions in the volume *Geomancy and Other Forms of Divination*: M. Benedetto, "Geomancy and Other Forms of Divination in the Jewish Middle Ages", 225-241; J. Rodríguez-Arribas, "Divination according to Goralot. Lots and Geomancy in Hebrew Manuscripts", 243-270; B. Villuendas Sabaté, "Arabic Geomancy in Jewish Hands. Specimens from the Cairo Genizah", 272-288; M. Melvin-Koushki, "In Defense of Geomancy: Šaraf al-Dīn Yazdī Rebuts. Ibn Ḫaldūn's Critique of the Occult Sciences", in *Arabica* 64 (2017), 346-403; Id., "Persianate Geomancy from Ṭūsī to the Millennium. A Preliminary Survey", in *Occult Sciences in Premodern Islamic Culture,* ed. N. El-Bizri, E. Orthmann, Beirut 2018, 151-199; Id., "Geomancy in the Islamic World", in *Prognostication in the Medieval World*, ed. M. Heiduk, K. Hebers, H. C. Lehner, Berlin-Boston 2021, 788-793. On geomancy in the Byzantine world, see Tannery, "Le Rabolion", III. "La géomancie chez les Byzantins", 354-372; A. Delatte, "Un traité byzantin de Géomancie (*codex Parisinus* 2419)", in *Annuaire de l'Institut de philologie et d'histoire orientales et slaves*, vol. 4, *Mélanges Franz Cumont* (Bruxelles 1936), 575-658.

[6] For a general account of the medieval geomantic tradition, see A. Palazzo, "New Perspectives on Geomancy: Introductory Remarks", in *Geomancy and Other Forms of Divination*, ix-xxx. On geomancy in modern vernacular literature, see H. Schlimpen, Artes manticae *y geomancia en las literaturas francesa y española altomodernas. François Rabelais y Francisco de Quevedo*, Berlin 2020.

Of all the names the Arabs used for geomancy, *ḍarb al-raml* (the striking or the throwing of sand), *khaṭṭ al-raml* (the line of sand or writing of sand), and especially *'ilm al-raml* (the science of sand) were the most common.[7]

When the Arabic treatises first started to be translated into Latin, several designations were applied to this newly imported divinatory technique. Hugo Sanctallensis' *Ars geomantiae*, believed to be the first translation of an Arabic geomantic work into Latin, adopted the term *geomantia*.[8] This was a term of Greek origin that until then had been used to designate one of the divinatory techniques related to the four elements; for instance, the term *geomantia* appears with this meaning in a passage from Varro known in the Latin Middle Ages via Isidor of Seville.[9] Ancient geomancy consisted of observation of the signs of the earth (earthquakes, volcanic eruptions, chasms, etc.) and had nothing to do with the geomantic method described in the Arabic tradition.[10]

Besides *geomantia*, other denominations were also used by translators and authors of geomantic treatises in the first phase of the dissemination of Arab geomancy across the Latin world:[11] for instance, *ars punctorum* or *ars punctatoria*, *ars arenaria*, *arenalis sciencia*, *scientia de linea* – the latter being the designation we find in the *EI*. All of these names translate the aforementioned Arabic definitions of geomancy much better than the word *geomantia*, because they evoke

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[7] T. Fahd, *La divination arabe. Études religieuses, sociologiques et folkloriques sur le milieu natif de l'Islam*, Leiden 1966, 196-198; Id., "khaṭṭ", in *The Encyclopaedia of Islam. New Edition*, ed. E. van Donzel, B. Lewis, Ch. Pellat, Leiden 1997, vol. IV, 1128-1130 (1128); E. Savage-Smith, M. B. Smith, *Islamic Geomancy and a Thirteenth-Century Divinatory Device*, Malibu 1980, 1, n. 2; E. Savage-Smith, "Geomancy", in *The Encyclopedia of Islam*, 3rd ed., Leiden 2013, vol. III, 98-101 (98); Villuendas Sabaté, "Arabic geomancy in Jewish hands", 274.

[8] Tannery, "Le Rabolion", II. "L'introduction de la géomancie en Occident", 318-329.

[9] Charmasson, *Recherches sur une technique divinatoire*, 10-12. Isidorus, *Etymologiarum sive Originum libri XX*, ed. W. M. Lindsay, Oxford 1911, VIII, 9, 13.

[10] Delatte, Delatte, "Un traité byzantin de Géomancie", 575-576; Savage-Smith, Smith, *Islamic geomancy and a Thirteenth-Century Divinatory Device*, 1, n. 1; Charmasson, *Recherches sur une technique divinatoire*, 10-11.

[11] Charmasson, *Recherches sur une technique divinatoire*, 12-13; Charmasson, "Les premiers traités latins de géomancie", 136.

the first operative part of its procedure, i.e., the tracing of lines of dots on the sand.

This notwithstanding, eventually the term *geomantia* prevailed in medieval literature: in his *De divisione philosophiae*, Gundissalinus used *geomantia* to designate Arabic geomancy, because he associated it with spatulomancy and chiromancy, two newly imported divinatory sciences (*sciencie iudicandi*).[12] Eventually, the *divisiones scientiarum* and the introductions to philosophy in use at the Arts Faculty in the thirteenth century formalized the denomination *geomantia*,[13] which is still current today.

The Geomantic Technique

The geomantic technique has already been thoroughly described in scholarship, especially by Paul Tannery and Thérèse Charmasson.[14] The specific subject of the present paper, however, calls for further analysis.

The geomantic method consists of two main stages. The first is the construction of figures or images that are positioned within the geo-

[12] Dominicus Gundissalinus, *De divisione philosophiae*, ed. L. Baur, Münster i. W. 1903 (Beiträge zur Geschichte der Philosophie des Mittelalters 4,2-3), 119,21-120,4. On divinatory arts in this work, see. A. Fidora, "Der wissenschaftliche Ort der Mantik in der Schule von Toledo (12. Jahrhundert)", in *Mantik, Schicksal und Freiheit im Mittelalter*, hrsg. v. L. Sturlese, Köln–Weimar–Wien 2011, 33-49 (39-44); Id., "Mantische Disziplinen als aristotelische Wissenschaft. Der epistemologische Integrationsversuch des Dominicus Gundissalinus", in *Die mantischen Künste und die Epistemologie prognostischer Wissenschaften im Mittelalter*, hrsg. v. A. Fidora, Köln–Weimar–Wien 2013, 61-72.

[13] Arnulfus Provincialis, *Divisio scientiarum*, in *Quatre introductions à la philosophie au XIIIe siècle. Textes critiques et études historiques*, ed. C. Lafleur, Montreal–Paris 1988, 319,253-255: "Geomantia et diuinatio facta circa negotia terrena, ut cum inquiritur de itinere faciendo uel de furto inueniendo." On divination in works belonging to this literary genre, see F. Fürbeth, "Die Stellung der artes magicae in den hochmittelalterlichen 'Divisiones philosophiae'", in *Artes im Mittelalter: Wissenschaft - Kunst - Kommunikation*, ed. U. Schaefer, Berlin 1999, 249-262.

[14] Tannery, "Le Rabolion", II. "L'introduction de la géomancie en Occident", 344-353; T. Charmasson, "La géomancie médiévale. Les traités et leur diffusion", in *Geomancy and Other Forms of Divination*, 5-29. More recently, see A. Beccarisi, "The Geomantic Technique and its Applications", in *Quaestio. Yearbook of the History of Metaphysics*, 19 (2019), 205-226 (208-216).

mantic chart or tableau. This is an inverted pyramid subdivided into fifteen compartments called houses (*domus*). The second is the interpretation of the geomantic theme according to technical rules and complex methods, which require proficiency, natural talent, a calm demeanour, and moral integrity on the part of the geomancer.[15]

After the questioner – or consultant – concentrates on the question, the geomancer must trace sixteen rows of dots on sand or paper, without counting the dots, moving from right to left.[16] Once all the lines have been produced and divided into groups of four, he marks off dots two by two until one or two remain in each line. The remaining patterns, which are vertical columns of four lines with one or two dots each, constitute the first four images. Sixteen different patterns of dots are possible, i.e., sixteen different geomantic figures. The four images thus obtained are the "mothers" (*matres*) and are placed side by side from right to left in the first four houses in the right upper part of the tableau. The following four figures in the left upper part of the tableau (the "daughters", *filiae*) are obtained by transposition. The heads – the first rows of dots – of the mothers are turned vertically and form the first of the daughters. The other three daughters are obtained from the remaining rows of the mothers: the second daughter from the second row, the third from third, the fourth from the bottom one. Then, the mechanism of addition already employed to produce the four mothers is used to generate the figures (nieces, witnesses, judge, and super-judge) in the remaining slots (houses nine to fifteen or sixteen). The four nieces (*neptes*) are produced by the combination of the couples of figures above each of them: the first niece (located in the ninth house) is generated by summing up the dots in each row of the first two mothers and marking off pairs of dots so that only one or two dots are left. In their turn, the three other nieces (occupying the tenth, eleventh, and

[15] Charmasson, "La géomancie médiévale", 7, referring to Bartholomew of Parma; Guillelmi de Morbeca *Geomantia*, I-IV, 4, ed. E. Rubino, Firenze 2021, partic. 1, dist. 1, 10,53-57.

[16] According to some sources, the geomancer is supposed to invoke God (or Christ or the Holy Ghost) before initiating the divinatory procedure. This and other ritual aspects of geomancy derive from the Islamic context, where geomancy was viewed not only as a divinatory technique, but also as a form of prophetic inspiration and supernatural knowledge. On all of this, see A. Palazzo, "Origin, Development and Decline of the Western Geomantic Tradition", in *Documenti e studi sulla tradizione filosofica medievale* 31 (2020), 417-441.

twelfth houses) are derived from the combination of the mothers in the third and fourth houses, of the daughters in the fifth and sixth houses, and the daughters in the seventh and eight houses, respectively. By the same method, the two witnesses (*testes*) (houses thirteen and fourteen) are derived from the four nieces above them, while the judge (*iudex*) (house fifteen) is formed from the combination of the two witnesses. If necessary, an additional figure, the so-called super-judge, is obtained from the combination of the figures in the first and fifteenth houses. The number of possible configurations of the geomantic theme is extremely high, amounting to 65536.[17]

As is clear, while initiated by a random operation (the so-called "casting of the dots"), geomancy has an intrinsically algebraic structure, because all the sixteen figures are combinations of four lines of one or two dots. Far from working at random, this system has well-defined computational regularities: for instance, the judge must always be made up of an even number of dots, the appearance of a judge made up of an uneven number of dots indicating an incorrectness in the procedure; thus, the judge not only contains the answer to the question asked by the consultant, but is also a test to the accuracy and reliability of the process.[18]

Each of the sixteen figures is good or bad, male or female, and has astrological connotations. The houses are related to specific areas of life (life and the inquirer; possessions; brothers, sisters, and neighbours; etc.). The first twelve houses are often associated with the twelve astrological houses. By interpreting the theme formed by the images located in the houses, the geomancer is able to foresee the Future and reveal the Unknown on behalf of the questioner seeking answers to pressing questions.

The function and meaning of the figures is certainly one of the most crucial aspects of geomancy. One should note that, among the arts

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[17] Tannery, "Le Rabolion", II. "L'introduction de la géomancie en Occident", 348.

[18] On the formal structure of geomancy, see R. Jaulin, *La géomancie. Analyse formelle*. Notes mathématiques de F. Dejean, R. Ferry, Paris–La Haye 1966; M. Pedrazzi, "Le figure della geomanzia: un gruppo finito abeliano", in *Physis. Rivista internazionale di storia della scienza*, 14.2 (1972), 146-161. See also W. van Binsbergen, *The Astrological Origin of Islamic Geomancy*, paper read at The SSIPS (Society for the Study of Islamic Philosophy and Science) – SAGP (Society of Ancient Greek Philosophy) 1996, 15th Annual Conference *Global and Multicultural Dimensions of Ancient and Medieval Philosophy and Social Thought*, 1-63 (5-11).

of prediction, geomancy had the prerogative of constructing itself the images it interpreted. Thomas Aquinas rightly stressed this peculiarity by ranging geomancy among those forms of divination performed by diviners seeking knowledge of hidden things by examining the result of what they did.[19] The images engraved and carved on talismans and amulets according to the rules and rituals of the so-called science of images were not usually used for predictions, but rather for performing wondrous operations.[20] But are geomantic figures truly the product of the operation of the geomancer? As we shall see, the geomancer is the instrument and not the agent of this operation.

From the aforesaid, it is clear that graphic elements play a crucial role in geomancy to the extent that the bulk of geomantic treatises consist of instructions regarding both aspects of the geomantic method, namely regarding how to construct and place the figures in the houses and how to obtain a response from the combination of the figures and the houses. All texts – some more, others less – are accompanied by graphic representations, charts, and tables illustrating the characters of each of the sixteen figures – considered apart or in connection with each other – and the fifteen houses, and showing the various steps of the procedure. Far from being accessory illustrations of the text, the graphic elements are interpenetrated with it, in the sense that they are both the basis and the result of the instructions supplied by the text. Therefore, a geomantic writing can be defined as a "visual text". Moreover, the text has a performative value, because the reader is encouraged to put into practice the explanations, being given directions on how to build a geomantic theme, read it, and apply it to specific cases. I will elaborate further on this aspect when I discuss the *EI* specifically.

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[19] Thomas de Aquino, *Liber de sortibus ad dominum Iacobum de Tonengo*, cura et studio Fratrum Praedicatorum, Roma 1976 (Opera Omnia 43), 203-241 (long version at 229-238; short version at 239-241), c. 3, 231,66-73: "Tertio uero modo aliqui notitiam occultorum requirunt ex hiis que per eos geruntur, eorum considerantes euentum: quod etiam multipliciter fit. Ad hoc enim genus pertinet geomantie usus, per quem quibusdam punctis descriptis eos diuersimode secundum quasdam figuras disponendo, aliquorum occultorum putant per hoc se notitiam posse acquirere."

[20] N. Weill-Parot, "Des images qui disent et font dire l'avenir? Talismans, divination et bonne fortune (XIIIe-XVe siècle)", in *Geomancy and Other Forms of Divination*, 519-535 (520-523), describes a few examples of divinatory use of talismans. In this regard, see also Albertus Magnus, *Mineralia*, II, 3, 3, ed. A. Borgnet (Opera omnia 5), Paris 1890, 51-52.

The *EI* and the Geomantic Procedure: Image Construction

Undeniably, the prologue of the *EI* provides scanty information on the construction of the geomantic theme. It does give instructions regarding the drawing of the four lines and the formation of the mothers, but these instructions are cryptical, and it omits directions for constructing the geomantic tableau.[21]

> Estimaverunt Indi, quod quando *lineantur linee absque numero et prohiciuntur pares et eriguntur, ex eo quod remanet, figure 4*. Deinde generantur et concluduntur. Ad inveniendam intentionem *significant* [: significat *Fl*] illud quod erit anime et facit eas necessarias orbis ad illud quod rectum est et interpretatur de eo quod in anima est.
>
> Nota, quod figure disponuntur secundum dispositionem orbis signorum ad illud quod est rectum, quia circulus erit secundum intentionem querentis et cognitionem cordis eius ad illud quod est rectum, et interpretatur de eo quod est in anima. Et sunt currentes cursu visionis, id est quia, sicut homo aliter in nocte aliquando sompniat quam in die disponat vel cogitet, ita aliter significant figure quam interrogans aliquando boni in animo vel mali ferat.
>
> Et earum quidem *percussio fit in arena munda, scilicet terra, et pulvere et farina, et cum incausto et lapidibus et digitis, ita quod utraque manu clausa erigat digitos quotquot et cum omni, cum quo possibile est, ut erigantur figure*. Sed nota, quod arena et incaustum et lapides frigide nature sunt et Saturnus frigide complexionis est, et ideo melius concordat cum eis, et ideo plus prevalet questio in nocte quam in die, quia nox est frigida. Cum arena et incausto et lapidibus, quia est in illis bonitas propter proportionem Saturni, id est propter frigiditatem et siccitatem in eis. Et propter illud fiunt in nocte veraciores quam in die.
>
> Et scias, quod, quanto est occupatio anime in eo, de quo queritur, plus et eius autumatio, id est moderatio, est vehementior, tunc questio est magis exposita et manifestior, et e converso.
>
> Et scias, quod non formantur figure secundum quod intendit querens nec secundum questionem eius, et non formantur in eis, nisi cum eo, cuius portendit potentia esse, sive querat de eo querens aut non querat, sic formantur, sicut formantur in visione. Et propter illud errat in eis qui credit, quod intentio egrediatur in eis secundum omnem

[21] *Fl*, f. 1ra (italics is mine in all the texts quoted). For the prologue, see Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 41. The prologue and the first part of the treatise had also been transcribed from *Fl* by Tannery, "Le Rabolion", IV, "La géomancie chez les Latins", 403-409.

> habitudinem in eis voluntarie, cum res non est ita. Et non formatur intentio in eis, nisi quando est in eis quod est, possibile esse et cuius casus est necessarius. Nam intentio illa est que formatur in eis. Et quando homo intendit rem, cuius esse non pertransit potentiam, non formatur in eis, nisi quando erit, sicut premisimus.

Lines are drawn (*lineantur linee*) – it is not specified how many – without counting (*absque numero*). Then the dots are marked off from each line two by two (*prohiciuntur pares*) and this eventually leads to four figures being extracted (*eriguntur*) from what it is left of the dots in each line.

The explanation is far from clear. Nothing is said about the number of the lines to be drawn, and the elliptical phrase "absque numero" does not clarify whether it is the dots of the lines – as indeed is the case – or the lines themselves that must not be counted. Finally, it is difficult to understand how the extraction of the figures from the remaining dots should be understood.

A few lines below, the *EI* adds that the operation must be carried out on clean sand, or dust, or flour with ink, stones or fingers, i.e., fingertips. Having closed both hands, the geomancer extends all fingers, as far as possible, so that the figures are extracted ("ut erigantur figure"). The explanation stops here, at the generation of the first four figures from the lines – the mothers –, no mention being made of the other eleven or twelve figures forming the geomantic theme.

The prologue of the *EI*, however, dwells on the concept of the *intentio*, which, as we shall see below, is at the heart of the geomantic process.

The paucity of information on the geomantic method contained in the prologue of the *EI* can be better appreciated if we compare it with the prologues of two other treatises, the *Ars geomantiae* and the *Lectura geomantiae*. These geomantic works are of different kinds: the former is, like the *EI*, an Arabic-to-Latin translation – it is even believed to be the earliest translation of a geomantic text – while the latter is a treatise originally written in Latin and belonging to Hermetic literature. The prologues of both these works are more detailed and informative about the construction of the theme.

The *Lectura geomantiae* (=*LG*) specifies that the procedure is based on four sets (*ordines*) of lines of dots, and not on four lines, with each of the four sets resembling a left hand with the thumb removed ("ad modum

manus sinistre, remoto police"). What comes next allows us to understand what is meant by the comparison with the left hand: the lines have different lengths, the first being long, the second longer than the first, the third shorter than the second and the fourth shorter than the third. In other words, the ratio of the lengths of the four lines to one another must be the same as that of the lengths of the four fingers with the exclusion of thumb. The visual representation that follows this description dispels any doubt:

> Incipit lectura ieomancie secundum Hermetem philosophum primum inuentorem et per angelum uocatum *** sibi reuelata in quodam monte uocato ***. Racio quare ista sciencia fuit reperta fuit ista: quare ille philosophus habebat unum filium extra patriam et uolebat scire si erat mortuus uel ne, ipse assendit in quodam monte et ibi fuit sibi reuelatum per dictum angelum quod haberet arenam coram se et quod faceret quatuor ordines linearum punctorum ad modum manus sinistre, remoto police, et fac quod primus sit longus, secundus longior primo, tercius minus longior secundo, et quartus minus longior tercio ut patet in hoc:
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> Postea angelus dixit sibi: "*Mortifica puncta*, et quid restat?". Illa restant puncta ad modum populi. Et tunc dixit angelus: "Vocetur Populus", et hec fuit prima figura: *Populus*. Et secunda est ad modum uie, ideo uocetur Via, ut hec: *Via*. Tercia non habet ordinem, ideo uocetur Carcer: *Carcer*. Quarta est ad modum coniunctionis, quare sicut coniunctiones fiunt in lecto ita fuit uocata Coniunctio, ut hec: Coniunctio. Et iste sunt quatuor prime figure que uocantur axes, et uocantur axes pro tanto quare tales sunt uoluendo in uno capite sicut in alio, uel possunt dici axes pro tanto quare fuerunt matres aliarum figurarum ab origine.
>
> Et nota quod semper debemus ietisare uersus manum destram et mortificare puncta uersus sinistram faciendo sic:
>
> •• ••••••••
>
> Et nota quod semper debemus ponere matres in parte dextra et filias in parte sinistra […]
>
> Et nota quod cum homo ietizat questionem non debet loqui aliquid donec faciat questionem et quod habeat intencionem suam super questionem etc.[22]

[22] *Lectvra geomantiae*, ed. T. Charmasson, in Hermes Trismegistus, *Astrologica et divinatoria*, ed. G. Bos et al. (CCCM 144C), Turnhout 2001, prol., 375.3-376.52.

After drawing the lines, the *LG* refers to the erasing of the dots (*mortifica puncta*), whereby the first figure is generated, in this case *Populus*, which is the only one made up of 8 dots. In general, the *LG* pays more attention to the first phase of the geomantic method, that is, the process of the construction of the first four figures, identified as *Populus*, *Via*, *Carcer*, and *Coniunctio* (the figures *simplices*). These figures – named *rectae* by the *EI* and *simplices* by Bartholomew of Parma[23] – are called *axes* by the *LG*, because they are specular in the sense that they remain the same when reversed; moreover, they are *axes* because they are the origin of other figures. The *LG* also adds that the mothers must be located in right side of the chart, whereas the daughters must be positioned in the houses on the left.

Eventually, the prologue of the *LG* remarks that whoever throws for a question (*ietizat questionem*) should not speak as long as he is engaged in the divinatory procedure and is concentrating on it ("donec faciat questionem et quod habeat intencionem suam super questionem").

Hugo of Sanctalla's *Ars geomantiae* (=*AG*) is even more detailed, because, right after the prologue, it dedicates an entire chapter ("Modus operandi in geomantia") to the process of the formation of the theme, starting from the drawing of the lines.

> Cum ergo geomantie artificium in usus congruos explicare coget necessitas, quid sit negotium mente sollicita diutissime reuoluens, et diuinum corde simplici implorando auxilium, in arena iam dicta *quattuor linearum inequalium ordines notis defixis, sed quomodo digiti in manu locantur, designabis. Quarum longitudo palmi unius quantitatem non multo debet excedere*. *Notis quidem prime linee paribus continue abiectis, pares aut inpares, quas remanere necesse est, ad partem dexteram seorsum ponantur*. De secunda quidem linea, tertia et quarta, non aliter exequendum erit. *Tandemque notas singulas sub aliis collocando, secundum uidelicet reliquum sub primo, tercium sub secundo, quartum sub tercio, figuram quandam que mater dicitur constitues*. Secundario item, tercio et quarto, lineis quattuor descriptis, matres quattuor, ut de primo factum est, occurrent. Quarum generatio sic procedit. *Figurarum quattuor principalium capitibus sumptis, paria sint siue imparia, post ipsas primas quintam, quam priorem filiam dicunt, generant*. Sic itaque principales quattuor figurarum notas assumens, ac deinceps in secundo ordine, quoque sub prima, secunda, tercia et quarta consistit, figuras quattuor, ut sic octo fiant, reperies. Ac deinceps *de duabus primis quandam aliam*

[23] See *Fl*, f. 4rb; Charmasson, *Recherches sur une technique divinatoire*, 35.

> *hac operatione formabis, ut uidelicet duarum figurarum capita assumens, paribus semper abiectis, ac si de secundo ordine usque inferius figuras quattuordecim compones.* Si uero de utraque figura nota una occurrerit, utramque collocabis. *Quinta decima namque ex tertia decima et ex quarta decima procedet, et hec perfecta dicitur*. Quam si impares note constituant, te aberrasse nulla est ambiguitas. Vnde ad matres erit recurrendum, ut digna sequatur correctio. *Sed sextam decimam prima et quinta decima constituunt. Nam secundum quosdam ex quinta et quinta decima eadem procedit.*[24]

The treatise explains that the geomancer, after concentrating on the question ("quid sit negotium mente sollicita diutissime reuoluens") and invoking God's support, draws four sets of lines of different length by making marks (*notis defixis*). The lines of each set are arranged as the hand's fingers and should not be much longer than the palm of a hand. Then, he proceeds to remove the marks from the first line two by two ("paribus continue abiectis") and position the remaining marks (one or two) on the right side (other treatises say the left side). He should then do the same with the other three lines, and thus obtain the first mother. By the same method he will then produce the other three mothers. The *AG* goes on to thoroughly describe the formation of all remaining figures in the geomantic chart. The heads, i.e., the first row of dots of all the mothers, are put together and form the first of the four daughters ("Figurarum quattuor principalium capitibus sumptis, paria sint siue imparia, post ipsas primas quintam, quam priorem filiam dicunt, generant"). The other three daughters are obtained from the lower rows of the mothers, the second from the second, the third from the third, the fourth from the fourth. Then, from the first and the second mother, the first niece is generated by summing up the dots in each row of the two mothers and erasing the dots by pairs until one or two are left. By this method, all the remain-

[24] I express my gratitude to Pasquale Arfé for putting this transcription from Paris, Bibliothèque Nationale de France, Lat. 7354, f. 3r-v at my disposal. On the *AG*, see P. Arfé, "Le dimore delle stelle nel *Prologus super Artem geomantiae* di Ugo di Santalla", in *Labor limae. Atti in onore di Carmela Baffioni*, *Studi Magrebini*, a cura di A. Straface, C. De Angelo, A. Manzo, NS 12-13 (2014-2015), vol. I, 41-71; Id., "L'*ars geomantiae* di Ugo di Santalla. Il testo e la sua tradizione", in *Geomancy and Other Forms of Divination*, 65-91; Id., "Attorno all'edizione dell'*Ars geomantiae*: le fonti esplicite e implicite", in *Quaestio* 19 (2019), 101-128; C. Burnett, "Hermetic Geomancy 'Rationes certis experimentis usitata'", in *Geomancy and Other Forms of Divination*, 135-141.

ing figures are generated, down to the fifteenth, the judge, formed of the combination of the thirteenth and the fourteenth, and the sixteenth, the so-called super-judge, which is produced from the combination of the figures in the first and fifteenth houses or, according to others, of those in the fifth and in fifteenth houses.

Compared with the detailed description in the *LG* and the exhaustive explication in the *AG*, the instructions contained in the prologue of the *EI* are vague and unsatisfactory. Are we therefore allowed to conclude that the *EI* assumes knowledge of the geomantic procedure? In my opinion, this is not the case, because, as we shall see, the formation of the images, called *continuatio* in technical terms, is actually clearly explained in an internal section of the *EI* (**C**).[25] In this section, the author carefully replies to three objections to make the geomantic procedure clear. The text also explains the generation of the witnesses and the judge, as well as the specific role played by *Populus*. This section ends with "Nos vero iam ostendimus, quod radix 16 et 4" (*Fl*, f. 3vb).

The Structure of the *EI*

The question arises as to why the *EI*, unlike the *AG* and the *LG*, describes the formation of the theme only in section (**C**) and not before. In my opinion, this decision depends on the structure of the *EI*. We now come to the second issue I raised at the beginning of this paper. The *EI* has a complex, multilayered structure. What at first looks like an unsystematic arrangement, full of repetitions, upon careful examination turns out to be a spiral structure with levels of increasing sophistication. It should also be noted that almost every one of the sections into which the text can be broken down is accompanied by visual tools (tables or charts), which mirror the growing complexity of the subject treated. These graphic representations help us to distinguish the different segments of the treatise. I will now briefly illustrate its structure.[26]

[25] As I will make clear below, I have made my own subdivisions of the text based on its contents.

[26] It is important to note that my subdivision of the text coincides only partially with the list of the topics provided as an appendix to the treatise in *L*, f. 12v; on this, see Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 38-40. As noticed by Zavattero (37-38, n. 31), manuscripts *E* and *Fr* diverge from the subdivision of the text proposed

A. In the first section, after the prologue, the *EI* gives the reader the basic notions of geomancy, i.e., the value – fortunate or unfortunate – of the figures, the factors influencing this value (*proprietas*, *locus*, *aspectus*, *associatio*, *paternitas*) and the meanings of the houses, i.e., the aspects of life they influence (e.g., *esse quaerentis*, *census*, *fratres*, etc.).[27] To answer a geomantic question, the meaning of the house must be combined with that of a figure.[28] Moreover, a figure's meaning can be changed by its appearing more than once in a geomantic chart. This segment ends with the words "Completus est sermo super 12 domos". In this section, the *EI* also provides a first graphic representation of the figures that it describes.[29] The fortunate figures are *Tutela foris* or *exiens*, *Tutela intrans*, *Limen intrans*, *Barbatus ridens*, *Comprehensum intus*, *Mundus Facie, Album*; the figures with a mixed value are *Aggregatio* or *Populus*, *Via*, *Coadunatio* or *Coniunctio*, and *Carcer*; the unfortunate figures are *Diminutus*, *Rubeus*, *Imberbis*, *Comprehensum foris*, and *Limes exiens*.[30]

B. The second text segment, partly omitted by *Fl*, contains more sophisticated notions, dealing with the intention of the inquirer, the *aspectus* of the houses, the meanings of the twelve houses (these meanings are examined more thoroughly than in section **A**), and the prophetic origin of the science of the line.[31]

C. Then, the *EI* discusses what we are mainly interested in here,

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by the table in *L* because they group together the sections dealing with the procreation of the Judge.

[27] See *Fl*, ff. 1rb-2vb: "Et scias, quod ex figuris quedam sunt, que sunt fortunate […] Completus est sermo super 12 domos." The topics discussed in this section correspond to the items 1 to 2 in the table of contents in *L*. Wherever necessary, the text transmitted by *Fl* is corrected without further specification on the basis of *Fm*.

[28] *Fl*, f. 1vb: "Et necesse est tibi cognoscere illud, quod significat domus, ut inquiras omnem questionem in domo sua, et permisce significationem domus cum significatione figure."

[29] *Fl*, ff. 1rb-1va.

[30] In the *EI* there are figures with more names: see Charmasson, *Recherches sur une technique divinatoire*, 30-32.

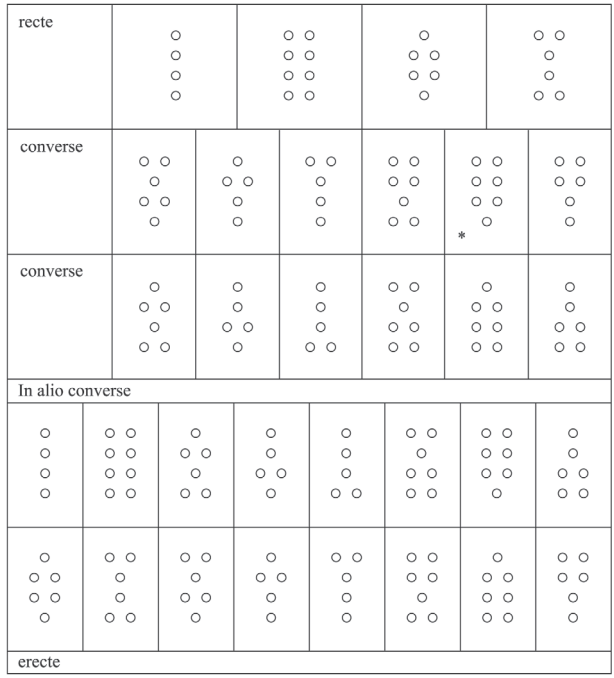
[31] *Fl*, ff. 2vb-3ra: "Figura prima est figura singularis in sorte […] et est ultimus finis earum et eorum status." These topics correspond to items 3 to 7 of the table of contents in *L*. *Fl* has a long omission in this section. For the complete text of the section, see *Fm*, ff. 2rb-3rb.

namely, the formation of the theme.[32] In this section, it is stated that, after treating the figures and establishing their roots and branches, it is time to investigate the houses. As we have seen, it is clear that the *EI* has already dealt with the houses. However, now its focus shifts from their abstract meanings to the process of the formation of the geomantic chart ("De continuatione 12 domorum") leading to the production of the judge in the fifteenth house.

Then, the *EI* introduces two tables, one of which links the figures to both the four elements and the sexes (*Fl*, f. 4ra), while the other groups the *figurae rectae* (*Via*, *Populus*, *Carcer*, and *Coniunctio*) and the *figurae conversae* (*Fl*, f. 4rb), respectively.

Feminine terree			
○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○
Ignee masculine			
○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○
Aquee feminine			
○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○
Aeree masculine			
○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○

[32] *Fl*, ff. 3ra-4rb: "Quia ergo iam diximus figuras et radices earum firmavimus et ipsarum ramos, nunc narremus domos secundum investigationem, sicut fecimus in figuris […] expositionem sequi faciemus post hoc, si Deus voluerit."



∗[33]

A small chapter is interposed between the two tables. It is dedicated, once again, to the generation of the figures (*procreatio*). The mothers are said to be drawn from the lines traced on the sand ("elevantur ex percussione"), whereas the others are "procreated" from the mothers (*procreantur*) by *communicatio* and *commixtio*. The process stops at the figure in the fifteenth house. Here, it is possible to unveil the truth and what lies inside men ("in pectoribus hominum"), what is formed in their minds ("formatum in eorum mentibus"), the intentions that are in their souls ("continuatum cum […] intentionibus, in animabus ipsorum"). God is here evoked as the main actor in the geomantic process, because he is said to make evident what is hidden.[34] After a brief refer-

[33] Here, *Fl* mistakenly has *Barbatus* instead of *Diminutus*. I have corrected on the basis of *A*.

[34] *Fl*, f. 4ra-b: "Et procreatur ex duabus figuris erectis, scilicet una ex matribus et altera ex filiabus. Figura una, que est 15, sicut premisimus, et est ultima earum et status ipsarum. Et apud ipsam stat communicatio et procreatio. Quando ergo descendit in

ence to the sixteenth figure (the super-judge), the text segment seems to end and the *EI* addresses another topic.

But why does the *EI* deal with the construction of the geomantic theme in this section (**C**) and not before? My conviction is that the *EI* considers it necessary to first provide its readers with fundamental knowledge of geomantic notions and issues to enable them to fully understand the construction of the figures and thus to use the geomantic chart for solving a question. The values of the figures and meanings of the houses (**A**), the understanding of the intention, the *aspectus* of the houses, the meanings of the houses, and the prophetic origin of the science of the line (**B**) are all crucial aspects that need to be known prior to describing the production of the daughters from the mothers and of the nieces from the mothers and daughters.

D. At the outset of the fourth text segment,[35] the *EI* declares that, in this part, its real intention is to integrate Abusaid's exposition of the operation of the line with all the other aspects related to the production of the figures, the properties of the figures and the houses, and their relationship. Abusaid Tripolitanus – who is referred to several times in the texts under different forms and is also mentioned in the *incipit* of *Fl* (f. 1ra) as Alatrabulucus – is the Latin equivalent of Abū Sa'īd al-Ṭarābulūsī. Several treatises on geomancy have been attributed to this figure. Nevertheless, today there is some scepticism about both the authorship of his literary production and his actual existence. I am inclined to think that al-Ṭarābulūsī is not the author of the *EI*, but either an important source for the *EI* or an illustrious name in the geomantic field evoked to lend more authority to the tractate.[36]

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domibus, detegit tibi visibilitates rerum et earum veritates et quod ex eis est minimum et quod ex eis est grande et proprietatem earum et communicationem ipsarum et totum, quod accidit ex omnibus accidentibus stantibus in pectoribus hominum et formatum in eorum mentibus et continuatum cum transitibus eorum accidentibus, id est intentionibus, in animabus ipsorum. Et quod velatum est et occultum extrahit *deus* [omne: *Fl*] de privatione ad esse et ex occultatione ad apparitionem solutione sana et virtute."

[35] *Fl* ff. 4rb-5vb: "Iam autem Albusaid Tripolitanus expositionem operis cum linea et qualiter cum ea lineatur in terra […] Et similiter procreatio currit hac via in fortitudine et debilitate." The section corresponds to the items 8 to 12 of the table of contents in *L*.

[36] For my hypotheses concerning Abusaid and his role in the *EI*, see Palazzo, "L'*Estimaverunt Indi*", 201-203 (for the edition of the passage where Abusaid is quoted, see 218-220).

This part also includes the analysis of the ascendant, which is the figure formed in the first house. Here, the *EI* makes an analogy between astrology – which, based on the ascendant, houses, and planets, prognosticates what becomes evident from these factors ("loquitur super illud, quod apparet ex eis") – and the science of earth – another name for geomancy –, which, through the geomantic method (by obtaining the figures from the lines, forming the other figures in the houses, and coming to the fifteenth house), tells us what becomes manifest in the properties of the houses and the figures ("et loquitur de eo, quod ei apparet in eis"). The result becomes manifest to whomever has the will and capability to understand. The first house, the *EI* adds, is the ascendant and the house of life, because "the question was dead and was then resurrected", "it was discovered and hidden in the soul of its lord, and then came to light and into existence, just as a newborn that was first in his mother's womb then came from darkness to light, showed himself, and died".[37]

[37] *Fl*, f. 4va: "Ascendens est figura prima, que formatur, et ascendit in prima domorum ex percussione et ex motu terre secundum intentionem eius. Incipit ergo et apparet et elevatur et egreditur de privatione ad esse et de occultatione ad apparitionem, et est locus questionis nobilis, quam *accepit* [*om. Fl*] astrologus et erigit super eam ascendens et equat domos et rectificat planetas et loquitur super illud, quod apparet ex eis. Et similiter scientia terre est hoc modo, quando consurgit linea in terra et facit stare figuras, scilicet in agrum, et generat eas et procreat et facit eas provenire ad ultimum earum. Cum ergo procreantur et stant et formatur in domibus suis, aspicit ad proprietates domorum et proprietates figurarum, et quod apparet in eis, et loquitur de eo, quod ei apparet in eis. Secundum hunc ordinem consurgit linea et completur et convenit res eius, et hoc manifestum est volenti vel habenti intelligentias et non occultatur super illud, cui est intelligentia. Domorum prima est ascendens et est domus vite, quoniam questio fuit mortua et revixit et privata et est apparens, vel inventa et occultata in animo domini sui, et apparet et est, sicut natus, qui fuit in ventre matris, et natus est et exivit de tenebris ad lumen et apparuit et spiravit." We find the passage on the ascendant quoted by later treatises, e.g, the *Geomantia* ascribed to William of Moerbeke and Bartholomew of Parma's *Ars geomantie nova*: see Zavattero, "*Estimaverunt Indi*: la diffusion", 75-78; A. Beccarisi, "Guglielmo di Moerbeke e la geomanzia", in Guillelmi de Morbeca *Geomantia*, viii-lviii (lv-lviii). Significantly, the term *astrologus* is omitted in William and Bartholomew's quotations. I do not agree with A. Beccarisi, "Qualche considerazione sulla *Geomantia* attribuita a Guglielmo di Moerbeke", in *Quaderni di Noctua. La tradizione filosofica dall'antico al moderno*, 5 (2019), 554-603 (572): "[…] il testo della *Geomantia* attribuita a Moerbeke […] la [i.e. *EI*] inserisce anche in un contesto epistemologico, completamente assente nell'*EI* ovvero il gioco di influenze che si determina tra i movimenti delle sfere celesti, l'anima del geomante e il getto dei punti [...]." Even though no mention of the motion of the celestial spheres

Then, the *EI* goes deeper into *communicatio*, *commixtio* and *procreatio*,[38] offering a detailed account of how the figures, combined, give birth to new figures. These processes have already been explained before in a short chapter (section **C**, *Fl.*, f. 4ra-b), but now the analysis is much more in depth.

The *EI* addresses again the issue of fortunate and unfortunate figures. In this case, however, it describes their generation and *commixtio*,[39] which it had not done earlier (*Fl* ff. 1rb-1va, ff. 2ra-2va). It then takes up the issue of strong houses.

E. At the outset of this section,[40] the *EI* declares that the preceding discussion (*sermo*) included all that happens in the world with regard to both minor and great things, all that was found concerning human beings, animals, minerals and all other things;[41] now, the author of the *EI* is going to recapitulate and abbreviate what has been already said in order to clarify what is yet to be said. The *EI* adds that long study, experience, and a mind penetrating God's help are the requirements of a proficient geomancer, because they are needed to gain a complete knowledge of the meanings of those qualities and those operations – the sentence is far from clear, but the text is likely to refer to the qualities and the operations of the figures in the chart.[42]

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is made in the abovementioned passage, the interplay between celestial influences, the geomancer's soul, and the casting of the dots are referred to in other parts of the *EI*, e.g., the prologue.

[38] *Fl*, f. 4vb: "Et incipiam nunc a rememoratione communicationis et commixtionis et procreationis et ostendam unamquamque earum, secundum quod exigit declaratio eius, et quid inquiratur de eis vel in illo, et exponam illud in expositione manifesta et sufficiente."

[39] *Fl*, f. 5rb: "Ratiocinare ergo super eas et scias, quod, quando tu rem linee preparabis, tunc tu ascendes in ea usque ad rem defficientem, quod est quia, quando lineantur et generantur figure 4 et eriguntur cum formis suis, tunc fortasse sunt omnes fortunate aut infortunate aut permiscetur fortuna cum infortunio."

[40] *Fl*, ff. 5vb-10va. The topics discussed in this section correspond to items 13 to 37 in the table of contents in *L*.

[41] *Fl*, f. 5vb: "Iam autem precessit sermo noster secundum omne, quod contingit in mundo ex minimo rerum et ex magno earum, est inventum et est existens in eis ex generibus hominum et omnibus animalibus et mineriis et reliquis."

[42] *Fl*, f. 5vb: "Et nunc ego rememorabor ex eis aliquid et abreviabo, ut sit illud quod dixi significatio super illud quod non dixi, et quod narravi, cum non sit communicans cum eo et continuatum cum eo, cum non exprimatur omnis cognitio significationum

After these brief remarks, section **E** goes into a long series of questions related to specific areas of life and solutions based on the different meanings the figures acquire when they occur in the houses. Several topics are covered: the retrieval of lost things ("de recuperatione rei"), the intention of a king ("Modus alius in intentione regis"), absent people ("Capitulum aliud de absente si coniungatur cum eo an non", "Capitulum de absente quomodo se habeat," etc.), things that are hoped for ("Et est alius modus de re que speravit"), things that are feared ("Capitulum aliud si querat aliquis de malo quod timet"), a traveller on a trip ("Capitulum viatoris in itinere"), grain ("De seminibus"), scarcity of rain ("Capitulum paucitatis pluvie"), the search for necessary things ("Capitulum in inquisitione necessitatum"), life in society ("Capitulum in communicatione, scilicet societate"), the raising of the king ("Capitulum in elevatione regis"), someone departing or arriving ("de egrediente et ingrediente"), the request and what is obtained ("De rogatione et quesito"), friendship ("Capitulum aliud de amicitia" and "Capitulum aliud amicorum et inimicorum"), a trip by sea or river ("De itinere in mari vel flumine"), an ill person ("Capitulum de infirmo"), an escaped or fleeing or lost animal ("De fugitivo vel fugiente animali vel amisso"), marriage ("Capitulum de coniugio"), whether a woman is chaste or not ("De muliere utrum sit casta an non"), the king or a prelate ("Capitulum regis aut prelati"), a jailed person ("Capitulum de incarcerato"). Each chapter is closed by the invitation to adopt the solutions it offers (*proba*, *invenies*, *lege*, *cognosces*, *scias*, *considera*). As is clear, this part was intended as a supply of examples for the application of the geomantic method to specific questions.[43]

It should be noted that there is a strong similarity, in both structure and function, between geomantic sets of questions-and-answers and the interrogations found in astrological literature. Moreover, both give us invaluable insights into the habits, concerns, and activities of medieval people.[44] A difference between the two divinatory devices,

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eorum accidentium et operationum earum, nisi post studium longum et experimentum et mentem penetrantem auxilium dei."

[43] On the field of application of geomancy, see the observations of Beccarisi, "Guglielmo di Moerbeke e la geomanzia", xxii-xxix.

[44] On the method of interrogations, see *Speculum astronomiae*, capp. 9, 14; L. Thorndike, "The Latin Translations of Astrological Works by Messahala", in *Osiris*, 12 (1956), 49-62; C. Burnett, "*De meliore homine.* 'Umar ibn al-Farrukhān al-Ṭabarī

however, lies in the fact that geomancers are urged to repeat the casting of the dots if the figures obtained in the first place do not disclose the intention, i.e., the solution, while interrogations regarding the same subject addressed to astrologers must not be repeated.[45]

Collections of questions and solutions were a crucial part of medieval geomantic works. In some cases, these collections ended up having an independent circulation. The most famous case is the geomantic treatise translated by Gerard of Cremona, known as "Si quis per artem geomanticam" from its *incipit*. More than ten manuscripts are known to only preserve the anonymous second part ("Si de statu corporis"), where examples of geomantic questions and solutions are presented.[46] This suggests that Gerard's translation was readapted for immediate practical purposes, the first part, which describes the geomantic method, no longer being required.

To our present knowledge, no manuscripts are known to only transmit section **E** of the *EI*, a likely indication that the *EI* was not seen as a mere ready-to-use collection of solutions. This is a consequence of how the treatise understands the nature of the geomantic art. As the text points out at the beginning of section **E**, the geomancer's ability to decipher the meanings of the figures in the chart requires his preliminary advanced knowledge of the technique (based on long study, experience, and understanding of God's assistance). In light of this concep-

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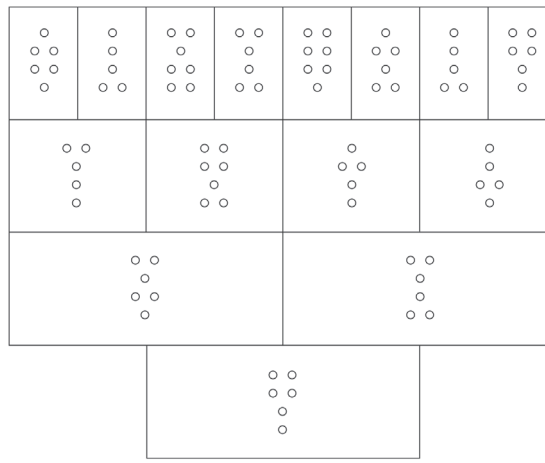
on Interrogations: A Fourth Translation by Salio of Padua?", in *Adorare caelestia, gubernare terrena: Atti del colloquio internazionale in onore di Paolo Lucentini (Napoli, 6-7 Novembre 2007),* ed. P. Arfé, I. Caiazzo, A. Sannino, Turnhout 2011, 295-325; C. Ph. E. Nothaft, "A Fourteenth-Century Scholastic Dispute on Astrological Interrogations", in *Vivarium*, 59 (2021), 241-285 (241-260).

[45] *Fl*, f. 8va: "Capitulum aliud de intentione. Cum equantur significatores, id est significatrices figure, et non declaratur illud, quod vis, tunc abtine [*sic*] a sermone et itera percussionem et scias iteracionem figurarum, que exierint in percussione prima et que iterantur in secunda. Ipse enim detegent tibi intentionem, quam vis, quando preparaveris eas et sciveris domos ipsarum, que exiverunt in prima et que iterantur in ea. Ex eis enim declarabatur tibi cognitio eius, quod vis, et si iteraveris eas tertio et sciveris intentionem earum et fixeris mentem in eo, tunc invenies, si deus voluerit." On the problem of mistakes in the geomantic technique, see E. Rubino, "Irrtum in geomantischen Wissenschaften. Die 'Geomantia' des Wilhelm von Moerbeke", in *Irrtum–Error–Erreur*, hrsg. v. A. Speer, M. Mauriège, Berlin 2018, (*Miscellanea Mediaevalia*, 40), 83-93.

[46] Charmasson, *Recherches sur une technique divinatoire*, 130-131.

tion, it would be hard to extract the question-and-answer section from the general structure of the *EI*.

Section **E** concludes with a representation of a geomantic tableau (*Fl*, f. 10ra, marg. inf.).



It is worth noting that toward the beginning of this section we find the famous *explicit* by which the *EI* treatise was cited in the prologue to the 1277 condemnation ("Ratiocinare ergo super eum, et inuenies, etc."). [47] This means that the Bishop and the censors used a shorter version of the *EI*. Elsewhere, I have already put forth a hypothesis as to why in Tempier's *Syllabus* the *explicit* is positioned at this very point. [48] Here, I would only like to add that in the *EI* the *explicit* comes immediately after the words "Et si fuerit in domibus contrariis, erit coniunctio significans contrarietatem et inimicitiam, et iam descripsi tibi proprietates

[47] *La condamnation parisienne de 1277*. Nouvelle édition du text latin, traduction, introduction et commentaire par D. Piché, Paris 1999, 76. *Fl*, f. 7ra: "*Ratiocinare* [Rationare: *Fl*] ergo super eas et invenies si deus voluerit". The reading *eas* instead of *eum* in *Fl* is attested in the critical apparatus of the edition of the Syllabus.

[48] Palazzo, "L'*Estimaverunt Indi*", 192-203, where I have highlighted the markedly Islamic character of the part of the treatise before the *explicit*. Moreover, one could add that this part of the treatise already contains most of the geomantic notions and could as such be taken as a model of the geomantic art. Furthermore, the prologue to the treatise makes a reference to Saturn, an additional reason to make its first part suspect.

domorum et figurarum". This sentence might have led someone – a copyist, a reader, or Tempier himself and his committee of censors – to believe that the text had already discussed all of its subject, whereas the "iam descripsi tibi" had to be understood as referring to the different meanings of *Coniunctio* (a type of figure) with regard to the question on an absent person.

F. At the outset of this section,[49] the *EI* declares that it will again go over ("ad rememorationem") the issues of the line and of the figures considered separately in each house. First, the *EI* focuses on the figure in the fifteenth house, which is said to serve as a test of the validity of the geomantic inquiry. A figure with an odd number of dots in the fifteenth house is a sign of a failed procedure.[50] The main part of this section analyses the operations of each of the sixteen figures when positioned in the fifteenth house as well as the meaning each of them has separately in relation to the properties of each house.[51] The description of the meanings of the figures in the fifteen houses is accompanied by a graphic representation of each of them (*Fl*., ff. 10vb-15ra). The section ends with a table containing all the sixteen figures arranged one beside the other from left to right according to an increasing level of complexity: thus, the line starts with *Via*, with only 4 dots, goes through all the other figures formed of 5, 6, and 7 dots, in this order, and ends with *Populus*, the most complete, with 8 dots.

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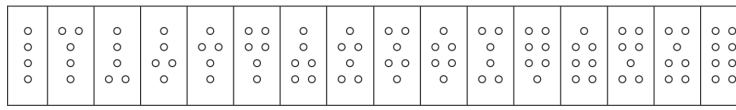
[49] *Fl*, ff. 10va-15va. The topics discussed in this section correspond to items 38 to 54 in the table of contents in *L*.

[50] *Fl*, f. 10va-b: "Capitulum quare non proveniat figura imparium punctorum in 15ª. Redeamus autem nunc ad rememorationem linee et figurarum eius singularium in domibus exquisite et esse figure imparis, *que* [qua *Fl*] non egreditur in 15ª penitus. Quod si tu lineas lineam et videris in 15ª figuram imparem, tunc ipsa est erronea penitus. Quere ergo errorem et invenies ipsum. Et causa ipsius, quare prohibetur ab exitu eius in 15ª, *est* [*om. Fl*], quoniam, quando *tu* [*om. Fl*] lineas lineam, scilicet comples res eius, considera tunc, si egreditur in 13ª, que descendit ex primis, impar. Tunc similiter erit 14ª, *que descendit ex secundis*, *impar. Procreatur ergo 15ª ex duabus imparibus par necessario, quoniam non procreatur ex duabus imparibus nisi par. Et si 13ª est par, tunc 14ª similiter est* [que ... est *om. Fl*] par. Procreatur ex eis ergo par. Scias ergo illud [*om. Fl*]."

[51] *Fl*, f. 10vb: "Capitulum in proprietate operationum figurarum 16 in 15 cum significatione earum singularium cum domorum proprietatibus."



Ordinatio domorum quarum prima est via.[52]

G. Section G goes a step forward.[53] The *EI* had already examined both each individual figure in relation to the different houses and the properties of the figures in relation to the properties of the houses, so as to clarify the properties, the virtue (*virtus*), and the weakness (*debilitas*) of the figures when they appear in the houses. All of this was shown to the person that builds the theme ("dispositori earum"). Now, the *EI* goes on to illustrate, with the support of God, each figure when it is in communication with, "procreated" by, or mixed with the other figures.[54]

In this section, however, the *EI* limits itself to the *procreatio* of *Populus*.

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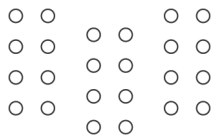
○ ○

[52] *Fl*, f. 15va.

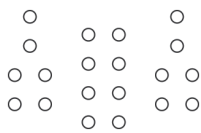
[53] *Fl*, ff. 15va-16ra. The topics discussed in this section correspond to item 55 in the table of contents in *L*.

[54] *Fl*, f. 15va: "Totum autem quod narravimus de *16* [15 *Fl*] figuris et 15 domibus non est nisi de una figura singulari, et nos non locuti fuimus super *communicationem et procreationem* [: procreationem et communicationem *Fl*] et commixtionem, scilicet ut communicet figura cum *figura* [*add.* cum *Fl*] sua contraria communicante sibi et procreetur eadem et continuetur propter se aut commisceatur cum corpore suo, et nos non locuti fuimus nisi super figuras singulares in domibus et proprietates suas et super proprietates figurarum in proprietatibus domus, ut sciamus per eas figurarum proprietates, quando descendunt in domibus, et virtutem ipsarum et debilitatem ipsarum, et ostendimus illud dispositori earum, et post illud communicabimus eas in communicatione et procreatione, et aggregabimus earum proprietates simul, et iungemus ad eas omnes intentiones earum singulares aut communicantes aut procreantes aut commixtas aut continuatas adinvicem, sicut ante narravimus, et deus est conveniens ad rectitudinem et adiuvans super illud."

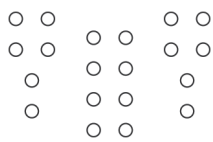
As the only figure composed of 8 dots, more specifically, 4 rows of 2 dots, *Populus* is obtained (*procreatur*) by the iteration of each of the sixteen figures, including *Populus* itself. As a consequence, *Populus* multiplies by two (*secundum duplicationem*) the property and the nature of the iterated figure.[55] Each triplet – the procreated *Populus* and the pair of the progenitive figures – is visualized by graphic representations (*Fl*, ff. 15vb-16ra).[56]



[*Populus* procreated by the iteration of *Populus*]



[*Populus* procreated by the iteration of *Tutela exiens*]



[*Populus* procreated by the iteration of *Tutela intrans*]

The *EI* returns to the *procreatio* of the figures in section **M**, where, however, it only examines the remaining seven even figures. As said above, only even figures can be the judge.[57]

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[55] *Fl*, f. 15va: "Nos autem iam premissimus [*sic*] in populo, quod ipse procreatur ex iteratione figure. Cum ergo sit ita, tunc ipse procreatur ex iteratione omnium figurarum. Cum ergo iteratur figura et *procreatur* [: iteratur *Fl*] ex ea *Populus*, tunc ipse ostendit proprietatem eius et ipsius naturam secundum duplicationem propter iterationem."

[56] Here I only reproduce the first three triplets.

[57] The section devoted to the triplets is relevant in an Arabic text that seems to be somehow related to the *AG*: see Villuendas Sabaté, "Arabic Geomancy in Jewish Hands", p. 287. Indeed, the *AG* describes the "procreation" of all the figures, not just that of the even ones.

H. This section is important because it highlights the connection between geomantic figures and the stars,[58] that is, between geomancy and astrology. It explains how a position *in ascendente* or *in occasu* impacts on the positive or negative value of the figures. The assumption that the *ascendens* and *occasus* positions influence the figures resides in the fact that the figures are rooted in the stars ("radix earum sit ex stellis").[59]

A circle is designed to give a visual grasp of ("ut videantur visione oculi"), and thus clarify, the notions of *ascendens* and *descendens/occasus* in relation to the figures.

Firenze, Biblioteca Medicea Laurenziana, Ms. Plut. 30.29, f. 16r
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[58] *Fl*, ff. 16rb-17rb: "Nos autem iam premisimus […] in mundo isto et in alio, quia prepositus est illius et potest super illud." The topics discussed in this section correspond to items 56 to 58 in the table of contents in *L*.

[59] *Fl*, f. 16rb: "Cum iam firmatum sit, quod radix earum sit ex stellis, et omnis figura, que est in ascendente, est fortunata, et in occasu eius, est contraria, scilicet ex figuris, que formantur ex duabus formis, illarum autem quibus est forma una in ascendente et in occasu, *esse* [*om. Fl*] est equale, quando ascendunt vel occidunt, et quando est figura in ascensione infortunata, tunc ipsa est in occasu eius contraria."

The circle contains six concentric spheres. The three outermost ones are subdivided into sixteen slots. The sixteen geomantic figures are positioned in the slots of the first and the third spheres according to a different order, while the second sphere provides the names and characterizations (fortunate or unfortunate) of the figures on the third sphere. As a consequence, sixteen slices are obtained, which associate each geomantic figure positioned on the first sphere with a figure on the third and the name and nature of the latter figure on the second sphere.

It is easily noticed that the figures on the third sphere are arranged in the four groups already identified by the *EI* in the first table of section **C**: in the first quadrant of the circle there are the figures *terree feminine*, in the second the *ignee masculine*, in the third the *aquee feminine*, and in the fourth the *aeree masculine*.

The second last sphere is subdivided into four sectors, each of which contains a line of dots of different length: the line that is linked to the *terree feminine* has six dots, the two lines associated with the *ignee masculine* and the *aquee feminine* have seven dots each, and the line connected with the *aeree masculine* is the longest, with eight dots. The innermost sphere is likely to represent the ground on which at the beginning of the procedure the lines of dots are drawn from which the mothers derive.

The author of the *EI* illustrates the purpose of the circle with the following words:

> Et ego quidem nunc fabricabo circulum, in quo significantur secundum modos earum et formam ascensionis earum et *ipsarum* [*om. Fl*] occasus, ut videantur visione oculi et discernantur earum ascensiones ab ipsarum occasibus et earum forme. Iste autem figure secundum hanc formam in ascensione et descensione in circulo ad occasum, que sunt a cardine terre ad medium celi, sunt ascendentes. Et que ex eis sunt ex medio celi ad occasum, sunt descendentes converse.[60]

After the circle, the *EI* refers to *equatores* and *astronomi* (astrologers), repeating that the figures are rooted in the stars because everything comes back to its root. With reference to the prologue ("in prologo

[60] *Fl*, f. 16rb. Since it serves to illustrate the influence of the *ascensus* and *occasus*, I do not think that the circle and its explanation are out of place in this section of the *EI*: on this point, see Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 48-50.

huius libri"), the *EI* states that it has already shown that the question is one and the same both in the line (that is, geomancy) and in astrology ("astronomia"), and both have the same relation to it ("proportio est eadem").[61] The reason for the connection between the geomantic method and astrology is given at the end of this section. Before getting there, the *EI* introduces a chapter dedicated to the houses considered in relation to the *ascendens* and the cardinal points. The text also examines the value of fortunate and unfortunate figures in their relationship with the fortunate or unfortunate houses. The reader is invited to apply the instructions regarding the fortunate and unfortunate figures every time a similar case occurs.[62]

The final part of this section refers to the *incipit* of the treatise ("Indi vero estimaverunt narrationes") and alludes anew to the initial phases of the geomantic technique: the lines are drawn without counting the dots ("lineantur linee absque numero"), the dots are erased two by two, and the figures are obtained ("componuntur ex eo, quod remansit ex omni linea post proiectionem paris, et eriguntur ex eis figure") and caused to exist by celestial necessity ("cogit eas orbis ad rectitudinem"). The very last sentences of this sections seem to suggest that the treatise ends here, as it is stated that every issue relative to geomancy has been shown, explained, abbreviated, and expounded in this work ("in hac compositione"). Then God is asked both for forgiveness for additions, mistakes and discrepancies and for salvation in both this and the other world, since God commands this world and has power over the other.[63]

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[61] *Fl*, f. 16va: "Et hoc est, quod volumus ostendere. Iam autem ostendimus proprietates figurarum singulares absque domibus, sicut narraverunt eas *equatores et astronomici*. Cum iam sit ostensum, quod *radix earum sit ex stellis accepta*, cum omnis res redeat ad radicem suam. Iam autem ostendimus in prologo huius libri, quod *questio in linea et in astronomia est una et proportio est eadem* et iudicium super eam similiter cum sede, id est ad instar questionis pulchre, sicut prediximus."

[62] *Fl*, f. 17ra: "Cum ergo vides fortunam, tunc iudica per illud, quod est ei simile, et, quando videbis infortunatum, tunc iudica per illud, quod est ei simile, id est per illud, quod est homogeneum ei, id est simile cum omnibus partibus suis, et cave ab eo."

[63] *Fl*, f. 17ra-b: "Indi vero estimaverunt narrationes ab eis in linea, quod, quando lineantur linee absque numero et componuntur ex eo, quod remansit ex omni linea *post* (*om. Fl*) proiectionem paris, et eriguntur ex eis figure, cogit eas orbis ad rectitudinem, et non proiciuntur pares, nisi quando proicitur res et contrarium eius, et remanet illud, quod remanet post *illud purum* (: illum primum *Fl*) sine contrario, aut remanet permix-

The mention of God is not rhetorical, because we know that God plays a crucial role as a main agent of the geomantic technique (see section **C**). Moreover, a few lines before the final part of this section, the *EI* had argued that God placed in the earth (*in terra*) the meaning of everything, which is foreknown through the stars and other things.[64] In other words, God, the maker of the stars, by giving meanings to the geomantic lines, guarantees that both geomancy and astrology express the same truths.

I. This section is a very short chapter where the organs of the human body are associated with the twelve houses.[65] It is reminiscent of *melothesia*, namely, that part of astrology that links human body parts with the planets and the zodiac signs.

The last sections of the treatise deal with the most complex procedures of the geomantic art, thus requiring specialist expertise from the reader.

K. First comes a section on the crucial concept of *intentio*.[66] The author provides several examples of the meaning (*intentio*) certain figures acquire when they appear repeatedly in several houses.

At the end of the section, the reader is invited to try this procedure several times until the solution comes to his mind. He should avoid drawing false conclusions, should not express his view about what he

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tum cum contrario suo et non remanet unum eorum ex altero. Cum *ergo complentur* (*inv. Fl*), determinant responsionem et contrarium eius. Iam autem ostendimus in hac compositione totum, quod aliis fuit dubium et explanavimus illud explanatione ultima et abreviavimus illud in ultima abreviatione et exposuimus illud ultima expositione aliis, ut allevietur servatio eius et appropinquet iuvamentum eius. Et non dimisimus aliquid de intentionibus linee, quod non dixerimus, neque de profunditate eius, quod non exposuerimus, neque ex dubitatione eius, quod non ostenderimus, et incurrimus in illo ad abreviationem et nos petimus Deum, ut condonet nobis illud, in quo est additio vel error vel deviatio, cum homo non *salvetur* (: solvetur *Fl*) a deviatione et errore et non fiat singularis *cum* (*om. Fl*) complemento, nisi deus habens celsitudinem et largitatem. Et peto ipsum, videlicet ut det nobis salutem in mundo isto et in alio, quia prepositus est illius et potest super illud."

[64] *Fl*, f. 17ra: "Deus autem iam posuit omni rei significationem in terra, que significetur ex precognitione ex stellis et aliis."

[65] *Fl*, f. 17rb: "Que membra hominis significent 12 domus [...] Scias ergo illud." The chapter is item 59 in the table of contents in *L*.

[66] *Fl*, ff. 17rb-18ra: "Quando lineamus in intentione et invenimus in 1ª *Comprehensum extra* […] ipse *est* [*om. Fl*] adiuvans." The section corresponds to items 60 to 62 in the table of contents in *L*.

is ignorant of, and should not say something that did not come to his mind or something that is different from what came to light in the lines. God is invoked to protect the geomancer, help him find the right solution, and warn him against diverging from the right solution by adding something or making mistakes.[67]

L. This section is dedicated to the technical procedure named *pars fortunae*.[68] As Irene Zavattero says with regard to the *Liber Salcharie Albassarith*, "*scientia puncti* and *pars fortunae* constitute a further level of interpretation of the theme that is not present in all geomantic treatises, namely a way of penetrating the secrets of geomancy more in depth".[69] The author of the *EI* concludes with the interesting remark that what has been described in this section is based on personal experience ("per experimentum apud nos").

M. This section is dedicated to what in technical terms is defined as the "procreation" (i.e., *Paternitas*) of the Judge, that is, the figure located in the fifteenth house.[70] The author examines all the possible triplets, i.e., the different combinations of pairs of figures leading to the Judge. Since, as we know, only figures with an even number of dots can be the Judge, the author only considers the triplets made up of even figures: *Via*, *Carcer*, *Comprehensum foris*, *Comprehensum intus*, *Tutela exiens*,

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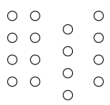
[67] *Fl*, f. 18ra: "Cum ergo cognoveris eas omnes, totum accipies secundum modum suum, et quando non oblivisceris ex eo aliquid, tunc proba, secundum quod narravi tibi, totum, quod redit super te, et proba te ipsum semel et multotiens, donec tibi totum istud universaliter cum ratione et experimento sano occurrat, et cave falsitatem in illo toto. Quod ergo conosces in illo *toto* [*om. Fl*], cum modo suo accipies, et quod non cognoscis, abstine te a sermone. Nam si currueris in illud ad loquendum illud, quod non apparuit tibi, scilicet ad diversum eius, quod apparuit in lineis, et non rectificatus fuisti ad rectitudinem, Deus autem *custodiat* [: custodias *Fl*] nos et adiuvet nos ad rectitudinem et condonet nobis et caveat nobis a deviatione et *additione* [: a ditione *Fl*] et errore, quia ipse est prepositus illius, scilicet rectitudinis, et potens [: prepositus *Fl*] super illud, et ipse *est* [*om Fl*] adiuvans."

[68] *Fl*., ff. 18rb-19ra: "Capitulum de parte fortune et aliis. Partium, quibus utuntur in linea 1[a], est pars fortune […] In hac descriptione multum ex eo, quod certum est per experimentum apud nos, et proiciemus ex eis res, que non sunt nobis certe et *posuimus ipsum unum* [*illeg. Fl*]." The section is item 63 in the table of contents in *L*.

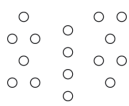
[69] Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 50-51. On these parts of the geomantic prognostication, see Charmasson, *Recherches sur une technique divinatoire*, 59-63.

[70] *Fl*., ff. 19ra-21vb. The section corresponds to items 64 to 72 in the table of contents in *L*.

Coniunctio, *Tutela intrans*. *Populus*, though an even figure, is omitted because it has already been considered in a previous section (**G**).[71] The explanation of the meanings of each triplet is accompanied by a graphical representation, as in the following two cases.[72]



Via autem procreata ex populo et via significat iter festivum et plausum et gaudia et peregrinationem et protectores legis et reges et pluviam et motum *propinquum* (: propinqui *Fl*), et est illaudabile coniugio et promissionibus propter reges et alios.



Hoc est signum itinerum et redeuntis et venientis et intrantis et exeuntis, et est mercationi et merci statio *sine* (: *super Fl*) lucro et absque amissione, et deus plus scit.

Interestingly, segment **M** is introduced in *Fl* by the following title: "In hoc libro deerant ista que secuntur capitula",[73] words that suggest that this section was an addition to the original structure of the *EI*. Should we deduce that the original version of the *EI* ended at the end of section **L**? If so, one may wonder whether the sections after **L** were added by the translator or whether **M** and the following sections were added by someone else to the original version of the *EI*.

N. This section describes the geomantic figures once again.[74] In this case, however, each figure is connected with a planet and a specific human physiognomy. This section is in line with the astrological characterization of geomancy put forward in section **H**. As in section **M**, all the explanations are supplied with a graphical representation of the figure analysed.[75]

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[71] *Fl*, 19rb: "Hic est capitulum de procreatione populi ex aliis. Quia superius ostensum est istud, ideo pretermisimus. Superius querere de populo."

[72] I have only reproduced the first two triplets: *Fl*, f. 19ra.

[73] *Fl*, f. 19ra. While the title is omitted by *Fm*, f. 15rb (*lac*.), *A* confirms the reading of *Fl*, omitting however the final word ("capitula"): *A*, f. 77vb: "In hoc libro deerant ista que secuntur."

[74] *Fl*, ff. 21vb-22ra: "Capitulum super modos figurarum. Capitulum locutionis super modos figurarum […] Populus malus Iovis significat virum complete stature, magni corporis et pectoris, rotunde faciei, qui habet barbas aut vulnera, que non separantur ab eo." This section is the item 73 in the table of contents in *L*.

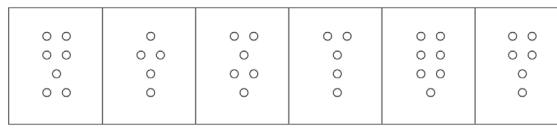
[75] I have only reproduced the first two figures: *Fl*, f. 21vb.

Quarum prima est *Coniunctio* et est infortunium Mercurii et significat citrinum hominem, longum facie, extenuati corporis, habentem genas oblongas et extenuatas, longum nasum, magnos dentes, subtilia crura, paucam barbam.

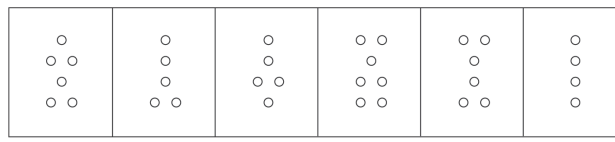
Carcer infortunium Saturni et significat brevem *humectati* [: hominem *Fl*] corporis, stature mediocris habentem dentes coniunctos, magnum caput, brevia brachia, colorem fuscum.

O. The last section, which opens with another reference to a passage ascribed to Johannes Albusaiz,[76] is dedicated to addition and diminution, the *scientia puncti*, and the *proiectio*, which are all technical procedures of the geomantic art and geomantic prognostication.[77] The first part of the section deals with addition or subtraction (*diminutio*), classifying figures into five groups: those figures that signify addition; those that signify subtraction; those that give without receiving; the figure that receives without giving; the figure that gives and receives very much. The figures are drawn as follows:[78]

Scias quod figure, que significant additionem, sunt 6 et sunt iste:



Et figure, que significant diminutionem, sunt 6 et sunt iste:

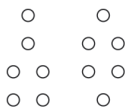


[76] *Fl*, f. 22ra-b.

[77] *Fl*, ff. 22rb-24ra. This section corresponds to items 74 to 88 in the table of contents in *L*.

[78] *Fl*, f. 22rb.

Et figure, que dant et non accipiunt, sunt iste:



Et figura, que accipit et non dat, est hec:[79]

Et figura, que dat magis et reddit ipsum, est hec:

The chapter on *scientia puncti* is defined as the most noble of the chapters because it deals with the secrets of secrets. This chapter is the perfect culmination of the geomantic art, because it discloses the intention and every hidden thing.[80] After this celebration, a description of the functioning of the *scientia puncti* is provided. Then comes a series of further chapters dedicated to the *proiectio*, another technical procedure.

Where does the *EI* – or the original version of the *EI* plus the added sections **M** to **O** – end? At first, it is hard to say because the *EI* seems to be transmitted with a different *explicit* by the various manuscripts. I am inclined to agree with Zavattero's view that the *explicit* must be placed at the end of chapter 88 and reads as follows: "Considera ergo

[79] *Fl om*. Et figura, que accipit et non dat, est hec [included the figure].

[80] *Fl*, f. 22rb: "Qui hunc librum edidit, inquit: Scias *o frater* [*om. Fl*] bene sollicite in hoc, quod *hoc* [*om. Fl*] capitulum est *nobilius* [: de nobilibus *Fl*] capitulorum et est de secretis secretorum in eo et rememoratus est eius aliquis *sapientium* [: sapientum *Fl*] propter zelum eorum super ipsum et est radix magna et super illud est ex locutione, cuius rememoratio prolongatur et per ipsum verificatur *tibi* [*om. Fl*] intentio tota et omnis res occulta et recta et per illud est nominum extractio nominum et numeri et occultorum." On the importance of the *scientia puncti* of the *EI* and its diffusion, see Zavattero, "*Estimaverunt Indi*: la diffusion", 69-75.

illud et iudica per illud quod significat figura".[81] In particular, the end of the treatise corresponds to the end of chapter 88 in two manuscripts: *A* (f. 96v) and *Fp* (f. 252vb: "Considera ergo illud et iudica illud quod significat figura"). In *Fm*, after the end of chapter 88 another treatise starts.[82] *Fl* adds at least another chapter to the *EI*.[83] Then three text segments follow that do not seem to belong to the *EI*.[84] After these short sections, *Fl* transmits the same treatise we find in *Fm*.[85] *L* includes a folio and a half between the end of chapter 88 and the table of contents.[86] The end of chapter 88 in *Fr* does not correspond to the *explicit* because this manuscript rearranges the textual material and moves previous sections of the *EI* to the end of the treatise.[87] *M* and *E* transmit a reduced version of the *EI*, lacking the final part of the text.[88]

Geomancy and Astrology according to the *Estimaverunt Indi*

The connection between geomancy and astrology is stressed by most geomantic treatises, often in the prologue.[89] The *AG* systematically re-

[81] Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 51-54.

[82] *Fm*, f. 19va: "Incipit tractatus de inveniendo querentis nomine priusquam ipse tibi patefaciat necnon et de inventione sue cogitationis et omnium occultorum."

[83] *Fl*, f. 24ra: "Capitulum in elevatione regis et in necessitate eius ex plagis et introitu eius in terram suam."

[84] *Fl*, f. 24ra-b: "Item figura geomancie ut intentionem scias querentis puncta omnia sola inferiora et superiora omnium figurarum collige in unum […]"; "Si vis nativitatem alicuius compone figuras et aspice […]"; "Quare 15 figure 15 domibus assignantur, 12 figure iuxta 12 domos […]."

[85] *Fl*, f. 24rb: "Incipit de inveniendo querentis nomine priusquam ipse tibi patefaciat necnon et de inventione sue cogitationis et omnium occultorum."

[86] *L*, f. 11v: "Considera ergo illud et iudica per illud quod significat figura"; f. 12r: "[…] significat et maxime in prima et secunda domo si ibi inveniatur."

[87] *Fr*, f. 69vb: "Considera ergo illud et iudica per illud quod significat figura"; f. 76vb: "tractavimus de figuris et hic circa finem de domibus scilicet proprietate figurarum et hic tractavimus de proprietate domorum. Explicit." For the structure of the *EI* in this manuscript, see Zavattero, "*Estimaverunt Indi*: la tradizione testuale", 37-38, n. 31 and 52.

[88] On the structure of *M*, see D. Juste, *Les manuscrits astrologiques latins conservés à la Bayerische Staatsbibliothek de Munich*, Paris 2011, (Documents, études et répertoires, 81. Catalogus codicum astrologorum Latinorum, 1), 74; Palazzo, "Origin, Development and Decline", 433.

[89] On this connection in the Jewish tradition, see Rodríguez-Arribas, "Divination

lates geomantic houses to the zodiac signs and the lunar mansions.[90] The treatise translated by Gerard of Cremona argues that geomancy is an art derived from the astrological truth: it uses sixteen figures, which it positions in twelve houses according to the astrological doctrine.[91] In the first *distinctio* of the first *particula* of the *Geomantia* attributed to William of Moerbeke, it is explicitly theorized that the inferior bodies are ruled by the celestial bodies. As a consequence, each geomantic figure is associated with a planet or a zodiac sign.[92] According to Bartholomew of Parma, each of the dots of geomantic images represents one of the stars of the zodiac constellations.[93]

As we have seen, the connection and/or correspondence between geomancy and astrology is a topic the *EI* deals with in several sections, particularly in part **D** dedicated to the ascendant, where the *EI* makes an analogy between geomancy and astrology, and in section **N**, which

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according to Goralot", 264-266. For an example of the combination of geomancy and astrology in consultations in Yemen, see A. Regourd: "Pratiques de géomancie au Yémen", in *Religion et pratiques de puissance*, éd. A. de Surgy, Paris 1997, 121: "au stade de l'interprétation, l'un des géomanciens calcule l'ascendant de l'heure à laquelle le tableau a été achevé et fait l'horoscope, puis conjugue les résultats dégagés par la voie de l'astrologie avec ceux tirés du tableau, pour forger un jugement. Il présente cela comme un des secrets de la géomancie yéménite." Even though geomancy is often described as a simplification of astrology, in my opinion the relationship between the two is more complex and must be rather regarded as a competition between two rival arts of prediction, with geomancy recognizing its links to astrology on the one hand, but insisting on the limits and mistakes of astrology on the other: see A. Palazzo, "Dibattiti filosofici e scientifici sulla geomanzia nel Medioevo latino", in *Trans/Form/Ação*, 42 (2019), 31-56 (37, 40, 49).

[90] Hugo Sanctellensis, *Prologus super Artem geomantiae*, in Arfé, "Le dimore delle stelle", 66,25-27: "Sicque manifestum est quod huiusmodi figure quas hic prosequi uolumus, signorum pariter et lunarium mansionum formas omnino sequuntur."

[91] Charmasson, *Recherches sur une technique divinatoire*, 131-132: Gerardus Cremonensis, *Si quis per artem geomanticam*, ms. Venezia, Biblioteca Nazionale Marciana,VIII-44, f. 103v: "Est autem geomantia ars ex veritate astronomica assumpta, que per certa signorum iudicia intente querentem de re dubia ad vera deducit iudicia […] Ad huius ergo artis scienciam, sedecim figurarum signis utimur, que per duodecim domorum mansiones secundum astronomicam doctrinam, locamus."

[92] Guillelmi De Morbeca *Geomantia*, ed. Rubino, partic. I, dist. 1, 9,42-43: "[…] corpora inferiora reguntur a corporibus supracelestibus, et ita sequuntur motum corporum superiorum." On the correspondence between geomantic figures and planets and/or zodiac constellations, see dist. 2, 13,50-22,42.

[93] Charmasson, *Recherches sur une technique divinatoire*, 14.

explicitly links the geomantic figures to the planets. However, the solid link this text establishes between geomancy and the stars, and thus astrology, is based less on the planetary and zodiacal values of the geomantic figures than on the concept of *intentio*.

In the prologue, the *EI* makes clear that the geomantic procedure is subject to astral influences. The geomancer draws the lines, without counting them. From the lines, the four mothers derive. The figures are made necessary by the celestial orb ("facit eas necessarias orbis"). Therefore, since the figures are arranged according to the orb of the signs ("figure disponuntur secundum dispositionem orbis signorum") and the orb is in agreement with both the inquirer's *intentio* and his deepest knowledge ("circulus erit secundum intentionem querentis et cognitionem cordis eius"), the figures signify what is hidden in the soul ("quod est in anima"). Based on the figures, the geomancer is able to discover the *intentio*, predict what is to happen to the soul ("illud quod erit anime"), and perceive what is in the inquirer's soul ("de eo quod in anima est").

In other words, a geomantic figure, the inquirer's mind, and the orb of the signs contain – each according to its own capacity and in a different way – the very same *intentio*. By drawing the lines without counting the dots, the geomancer acts under celestial influence; the result of his casting the dots is unintentional. As an instrument of celestial orbs, the geomancer activates the process that eventually provides the *intentio* with a visual form (the figures in the chart), bringing to light what is hidden in the celestial orbs.

The role of the inquirer is also passive because the figures are not formed according to his will ("non formantur figure secundum quod intendit querens nec secundum questionem eius"). Whether the inquirer asks a question or not, the figures are formed independently of his will, just as they appear when we see them in a vision ("sive querat de eo querens aut non querat, sic formantur, sicut formantur in visione"). Therefore, the *intentio* arises in the figures not as the product of a voluntary decision, but because it must; it only arises when it is the right time for it to arise and its possibility becomes a necessity ("Et non formatur intentio in eis, nisi quando est in eis quod est possibile esse et cuius casus est necessarius").

The passivity of both of the two agents involved in geomancy (the geomancer and the inquirer) is masterfully clarified by Thomas Aqui-

nas when he writes that the geomancer draws the lines without rational premeditation, while the inquirer acts driven by non-rational impulse (*interiori sollecitudine*) rather than rational deliberation.[94]

In fact, the real agent of geomantic prognostication is God. The frequent mentions, evocations, and invocations of God throughout the *EI* must be read as a reference to the Islamic origin of this science, as is explicitly pointed out in section **B**, where the *EI* is particularly concerned with seeking religious legitimation for geomancy by stressing its origin in the Koran and the prophetic tradition.[95]

Yet, these allusions also serve the purpose of calling the reader's attention to the role played by God in the geomantic procedure. At the end of section **H**, God is said to have placed in the earth the meaning of everything, which is foreknown through the stars and other things ("Deus autem iam posuit omni rei significationem in terra, que significetur ex precognitione ex stellis et aliis"). This guarantees the agreement of geomancy and astrology. With regard to the prologue, the *EI* argues that the figures are rooted in the stars ("radix earum sit ex stellis accepta") and the *quaestio* leading to the *intentio* is one and the same in the line and in astrology ("questio in linea et in astronomia est una").

We may interpret the passage in section **H** as meaning that the *intentio* is in God the creator as its first origin, then it finds expression in the orbs and is mirrored in the figures and the inquirer's mind. If this is so, the true interpreter of the geomantic theme, that is, of the meaning (*intentio*) arising from the geomantic figures arranged in the chart, is God. In section **C**, He is said to give life and unveil what is veiled and occult by providing a solution ("quod velatum est et occultum extrahit

[94] Thomas de Aquino, *De sortibus*, c. 4, 234,159-165: "unde et in protractione punctorum geomantie actores hoc obseruandum putant ut ille qui protrahit puncta absque premeditatione rationis procedat, et ille qui consultat quasi interiori sollecitudine instigatus interroget, non quasi ex deliberatione rationis." On Thomas' description of the geomantic method in the *De sortibus*, see L. Sturlese, "Thomas von Aquin und die Mantik", in *Mantik, Schicksal und Freiheit im Mittelalter*, 97-107 (100-104); P. Porro, "Divinazione e geomanzia in Tommaso d'Aquino: qualche osservazione sul *De sortibus*", in *Geomancy and Other Forms of Divination*, 143-166, Beccarisi, "Guglielmo di Moerbeke e la Geomanzia", xxvi-xxix.

[95] See Palazzo, "L'*Estimaverunt Indi*", 196-201; Id., "Origin, Development and Decline", 426-429.

deus de privatione ad esse et ex occultatione ad apparitionem"). In section **K**, God is invoked to protect, support, and forgive the geomancer who looks for the right solution.

In other words, the *EI* has a clear awareness of the complex interplay underlying the geomantic technique. The *intentio* lies hidden in the inquirer's mind, in the figures, and in the stars: the geomancer is the instrument by which God brings it to light and makes it understood.

Conclusion

The *EI* is one of the most authoritative, if not *the* most authoritative, treatises of geomancy the Latin West has ever known. Condemned in 1277 by Étienne Tempier, this work was praised by later Latin treatises as the origin of geomancy and thus widely quoted in the following centuries.

Compared with other geomantic works, the *EI* displays a much more complex and dynamic structure. Apparently unsystematic and deprived of a rational organization, it is actually a composite multilayered text with a clear internal articulation.[96] Its aim is not to provide an orderly exposition of geomantic notions and ready-for-use sets of questions-and-answers, but rather to familiarize the reader with the complexities and intricacies of the geomantic art. In the *EI*, the reader is led through several steps, from the rules governing the casting of the dots to the sophisticated methods of *pars fortunae* and *scientia puncti*, and to the mastery of geomancy, an art that is based on a rigorous method, long study, and God's support.

In other words, the *EI* must not be regarded as a theoretical description of geomancy, but rather as a way of moving towards the secrets of geomancy, a way of developing the ability to disclose the *intentio* in the figures the geomancer has produced under the influence of the stars.

From this perspective, the visual content of the text plays a crucial role. The progress of the text through the many sections I have identified is punctuated by a succession of images, charts, and tables. The

[96] This modular structure explains why there were sections and parts of the *EI* that had an autonomous manuscript circulation: see Zavattero, "*Estimaverunt Indi*: la diffusion", 66-77; Palazzo, "Origin, Development and Decline", 433-434.

visual representations are not embellishments of the text, but part and parcel of it, insofar as they visualize the steps of the geomantic method and are aimed at a practical learning of this method.

My analysis has also shown, in contrast to widespread assumptions, that the *EI* provides instructions on the formation of the geomantic theme and establishes a solid link between the geomantic method and celestial causality – and astrology –, a link based on the concept of *intentio*. The dependence of the geomantic technique on astral influence, however, must be placed in a broader "theological" framework. It is God who is the true agent of the geomantic procedure, in which the geomancer and the inquirer cooperate as instrumental causes.

Università di Trento

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Part III

Visio et cognitio

Représentations et schémas graphiques de la *species visibilis* dans le *De homine* d'Albert le Grand

Maria Manuela Brito Martins

Dessin fait probablement par Petrus Olavi (Peter Olovsson) aux alentours de 1381 et reproduit dans les notes de l'étudiant Olavus Thorstani de l'Université de Uppsala, en 1481 et qui représente le débat entre Aristote et Albert le Grand sur les facultés de l'âme. Uppsala Universitetsbibliotek, MS C599, fol. 143r.

Introduction

Il est devenu courant de considérer que la culture scientifique du Moyen Âge repose sur le livre et sur le texte. Cela est vrai, mais c'est trop facile à dire. Et, de plus en plus, aujourd´hui, nous nous rendons compte de l'importance que les médiévaux portent sur tous ou presque tous les domaines du savoir qui existaient à cette époque. Par ailleurs il y a un rapport étroit entre les domaines du savoir et les représentations visuelles et schématiques qui en découlent. Les auteurs matérialisaient leurs connaissances grâce à différentes techniques de visualisation,

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soit par une disposition du texte écrit, soit par des techniques de représentions graphiques produites dans les manuscrits. Je retiendrai trois formes de visualisation dont on souligne trois aspects :

1. Le rouleau, codex, manuscrit et puis le livre vu et visualisé, en tant qu'objet d'Écriture et son évolution, en sa visibilité matérielle et intellectuelle. « Les auteurs n'écrivent pas des livres : non, ils écrivent des textes qui deviennent des objets écrits - manuscrits, gravés, imprimés et, aujourd'hui, informatisés - »[1].

2. Les procédures ou techniques d'exposition du texte et de son contenu. À cet égard nous pouvons déceler des différentes techniques par rapport au genre scolastique qui nous occupe, le modèle de la *quaestio* et celui de la *disputatio*. En effet, c'est la *divisio textus*[2], qui imprime un schématisme à l'exposition, selon un modèle qui structure le texte en le divisant en parties et ces parties, en petites unités. Mais du point de vue du contenu, nous pouvons identifier un schéma qui exprime la manière dont l'auteur matérialise les arguments dans son texte. « Ce faisant, je soutiens que le scolastique s'est engagé dans une narratologie implicite, l'art d'analyser la structure narrative, les intrigues et les dialogues »[3].

3. Les représentations dessinées et reproduites au moyen de colonnes, d'arbres, de schémas, de tables et aussi de figures qui aident à clarifier et à décrire les parties logiques et philosophiques du texte. La technique de la *divisio textus* s'est élargie à la *divisio* des diagrammes reproduits dans les marges des manuscrits. « Plusieurs exemples de la *divisio* de diagrammes peuvent être rencontrés dans les marges des manuscrits des œuvres d'Aristote et des commentaires bibliques, ainsi que des commentaires sur les Sentences de Pierre Lombard »[4].

Les représentations géométriques reprennent quant à elles la pratique des auteurs anciens, tels qu'Aristote, Euclide, Ptolémée, et bien d'autres. Ces schémas géométriques constituent un cas particulier de visualisation insérée dans l'exposition du texte. Ils énoncent un problème physique, réfléchi au moyen des propositions de l'optique géométrique, que dans le cas d'Albert, entraîne des conséquences pour l'anthropologie et pour la métaphysique. Toutefois, les représentations anthropologiques issues de l'activité cognitive et visuelle, reproduites dans les manuscrits ou bien dans ses marges, restent en-

[1] G. Cavallo et R. Chartier, *Histoire de la lecture dans le monde occidental*, Paris 1997, 11.

[2] E. Even-Ezra, « Visualizing Narrative Structure in the Medieval university: *divisio textus* revisited », in *Traditio* 72 (2017), 341.

[3] Even-Ezra, « Visualizing Narrative Structure in the Medieval university », 345.

[4] Even-Ezra, « Visualizing narrative Structure in the Medieval university », 345.

core à évaluer, comme le montre le dessin reproduit dans le colophon de ce texte.

Nous nous pencherons surtout sur deux aspects de la visualisation du texte : sur sa forme interne d'exposition et sur les schémas géométriques reproduits par Albert dans trois sections de son *De homine*. En effet, le commentaire qu'Albert le Grand fait tout le long de ce traité obéit à une procédure scolastique qui divise et subdivise hiérarchiquement le texte de façon progressive, afin de mieux dégager le sens logique du commentaire. Cette méthode distinctive s'affirmera de plus en plus, durant le XIIIème siècle, et ses conséquences seront importantes pour le style du commentaire philosophique et théologique. D'après Ceslas Spicq « ces *divisiones per membra varia* sont une des notes spécifiques de l'exégèse dialectique du XIIIe siècle »[5]. Introduite par la première fois par Hugues de Saint Cher dans l'exégèse biblique, chez Albert le Grand « ces divisions organiques sont très multipliées »[6]. Par ailleurs, nous croyons qu'Albert apporte une nouveauté à la pratique de la division complexe, telle qu'elle est utilisée dans les prologues de ses commentaires bibliques[7] et dans les prologues des commentaires philosophiques, notamment celui du *De homine*. Notre propos est d'analyser ces 'prologues', bien qu'Albert ne les nomme pas ainsi alors qu'ils introduisent[8] l'ensemble des questions au moyen d'une série de dis-

[5] P. C. Spicq, *Esquisse d'une histoire de l'exégèse latine*, Paris 1944, 212.

[6] Spicq, *Esquisse d'une histoire de l'exégèse latine*, 213. A ce propos Gilbert Dahan parle dans l'étude « Le schématisme dans l'exégèse médiévale », in *Qu'est-ce que nommer ? L'image légendée entre monde monastique et pensée scholastique*, ed. C. Heck, Turnhout 2010, 31-40, sur l'importance et l'utilité du schématisme comme une des « réussites majeurs du Moyen Âge », 31.

[7] Spicq affirme à ce propos, *Esquisse d'une histoire de l'exégèse latine*, 215-216: «Au XIIe siècle, l'usage était de définir un livre par sa matière, son mode, son utilité et l'*intentio* de l'auteur ; ces rubriques analytiques se retrouvent au XIIIe siècle, chez Étienne Langton, Hugues de Saint-Cher, et même chez S. Thomas et le Pseudo-Thomas. Mais Albert le Grand atteste l'usage d'une formule nouvelle, philosophique, celle des quatre causes, plus rigoureuse que l'ancienne, et qu'il adoptera constamment dans le prologue de ses commentaires ».

[8] Sur les 'prologues' voir C. trottmann, « Sur les tout premiers prologues théologiques dominicains du XIIIe siècle », in *Les prologues médiévaux. Actes du Colloque international organisé par l'Academia Belgica et l'École française de Rome, avec le concours de la F.I.D.E.M.*, ed. J. Hamesse, Turnhout 2000, 515-533, sachant que cette étude ne vise pas les prologues philosophiques et de plus, que Christian Trottmann ne fait l'analyse que des premiers maîtres dominicains.

tinctions qui déterminent d'emblée la suite du développement à chaque section. En effet, l'ensemble du commentaire « Sur l'homme» obéit à cette méthode qui se distingue très nettement de la méthode des *Summae*, par exemple de Thomas d'Aquin.

Cette division des questions hiérarchiquement subdivisées nous permet de les représenter par la figure de l'arbre horizontal, très évidemment distincte du célèbre schéma de l'arbre vertical. À vrai dire, les commentateurs philosophiques « se sont tous familiarisés avec la figure de l'arbre vertical représentant une telle hiérarchie »[9]. Le modèle de cette figure, c'est l'arbre de Porphyre disséminé depuis Boèce au sixième siècle, dans des nombreux manuscrits. On reconnait aujourd'hui que ce diagramme en forme d'arbre « a mis en œuvre le fonctionnement de la structure visuelle »[10] . C'est ainsi qu'au treizième siècle Pierre d'Espagne utilise le diagramme traditionnel dans son Traité[11].

Mais les schémas dont nous allons traiter dans la suite de notre texte sont des diagrammes géométriques qui se rapportent à la perception sensible extérieure. En ces cas, les diagrammes sont appliqués à la manière dont la lumière se projette dans le milieu et comment l'œil la perçoit et produit les formes visuelles. D'un autre côté, est présente une réfraction de la lumière qui se dégage par rapport à la perception visuelle et au milieu. Les figures géométriques montrent à travers des lignes droites situées dans des positions spatiales distinctes, selon des

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[9] E. Even-Ezra, « Visualizing Narrative Structure in the Medieval university », 342.

[10] A. R. Verboon, « The Medieval Tree of Porphyry: An Organic Structure of Logic », in *The Tree: Symbol, Allegory and mnemonic Device in Medieval Art and Thought*, ed. P. Salonius and A. Worm (IMR 20), Turnhout 2014, 95.

[11] Petrus Hispanus, *Tractatus, called afterwards Summule Logicales*, ed. L. M. de Rijk, Assen 1972, 20. Voir à ce propos: Verboon, *The medieval Tree of Porphyry: An Organic Structure of Logic*, 98, qui affirme: « The historical tree inserted is derived from Edmond Pourchot's *Institutiones Philosophicae* dating from 1730, an example which dates to about a millennium later than its original conception in Boethiu's work. Pourchot's example is an elaborated version, which includes inferences on the left part of tree. Migne, in the Patrologia Latina, also provides an early modern printed example of the diagram to accompany Boethiu's commentary on the Isagoge and his Dialogue, anachronistically. The source Migne took these diagrams from its unknown. In other cases, the figure was published as part of editions of the text. […] De Rijk, in his edition of the *Tractatus* of Peter of Spain, gives a basic edition of the Tree of Porphyry diagram, consisting of compartments and lines, similar to the schematic rendering provided here ».

points situés dans des circonférences, la manière comme la lumière se réfléchit sur les objets et les surfaces, et comment l'œil humain perçoit l'ensemble. Ces diagrammes ne sont que des cas spécifiques des représentations visuelles reproduites dans les manuscrits[12].

1. La divisio textus dans le *De homine*

L'œuvre d'Albert le Grand est un bel exemple de la manière comme nous pouvons visualiser un texte à travers un schéma logique, c'est-à-dire un diagramme qui nous aide à saisir le mouvement dynamique du texte. Et si nous pouvons récupérer cette division dichotomique à travers la structure interne du texte, c'est parce que le texte lui-même est façonné selon une disposition qui nous la fait voir. C'est vrai que l'élargissement (*dilatatio*) de la quaestio « se prête parfaitement au débat académique »[13], mais dans ce cas-ci, la *quaestio* se structure selon une division dichotomique qui donne au départ une vision de l'ensemble des matières à développer.

Notre auteur a puisé ses ressources chez les scientifiques les plus importants de son temps et aussi dans les anciennes traditions grecque, latine, juive et arabe qui lui enseignent le savoir naturel disponible. Dans le *De homine*, surtout dans la partie qui concerne l'âme sensible, Albert traite du fonctionnement des sens et particulièrement celui de la vision.

Depuis Platon, les auteurs accordent un privilège au sens de la vue considérée comme le sens par excellence de la connaissance. On pose un rapport entre visibilité et intelligibilité manifesté par le moyen des différentes techniques, lesquelles deviennent des outils indispensables de reproduction du savoir, tant des sciences naturelles que des sciences plus théoriques et spéculatives. Ces techniques apparaissent comme des modèles de la rationalité constructive et visuelle. Une note des édi-

[12] Even-Ezra souligne l'existence des répertoires de cette *divisio* rencontrée dans des diagrammes en forme d'arbre, dans beaucoup des manuscrits, par exemple de Richard Fischacre dans ces Commentaires, et qui étaient désignés comme des arbres ramifiés (*arbores ramificatae*).

[13] S. Ebbesen, « Medieval Latin Glosses and Commentaries on Aristotelian Logical Texts of the Twelfth and Thirteenth Centuries », in *Glosses and Commentaries on Aristotelian Logical Texts. The Syriac, Arabic and Medieval Latin Traditions*, ed. C. Burnett (Warburg Institute Surveys and texts 22), London 1993, 139.

teurs dans les 'Prolegomena' portant sur le genre et la disposition de l'œuvre nous fournit un argument supplémentaire en faveur de notre approche sur la technique dichotomique utilisée par Albert le Grand [14]. En effet, les éditeurs indiquent que la disposition de leur édition critique est faite selon la tradition manuscrite et qu'ils suivent la structure qu'Albert lui a donnée[15].

1. 1. La section sur la vision

Dans la partie sur l'âme sensible (*De anima sensibili*), et dans la section traitant de la vue (*De visu*) siège de la perception externe, Albert s'interroge pour quelle raison le sens de la *visio* est le premier et le plus important des sens. Le maître de Cologne le définit en recourant à différentes autorités, parmi lesquelles Jean Damascène, Grégoire de Nysse (en réalité Nemèse d'Émese) et Avicenne. Ces trois auteurs donnent une définition de la vue centrée sur des éléments physiologiques : le sens de la vision est un organe placé dans la partie antérieure du cerveau, selon Grégoire de Nysse, dans le nerf optique, selon Avicenne, et finalement, selon Jean Damascène, placé dans le nerf cérébral et l'œil[16].

Mais dans le *sed contra* qui s'oppose à ces trois définitions , Albert réfute la primauté donnée au sens de la vision en citant Avicenne, le philosophe censé soutenir cette position : « Le premier parmi les sens en raison duquel l'animal est un animal, c'est le sens du toucher »[17].

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[14] Cf. L. Honnefelder, « Prolegomena », in *Albertus Magnus*, *De Homine*, ed. H. Anzulewicz et J. R. Söder (Opera omnia 37.2), Münster, 2008, xiii.74-99.

[15] L'édition de Borgnet donne une autre disposition de l'œuvre, en divisant le texte en : Traité, Questions et articles.

[16] Albertus Magnus, *De homine*, 1.1.1., ed. J. R. Söder (Opera omnia 37.2), Münster 2008, 145. 24-36 : « Dicit Damascenus in secundo libro XVIII capitulo : 'Visus est primus sensus, cuius organa sunt, qui ex cerebro nervi, et oculi. Et sentit secundum primam quidem rationem colorem; dinoscit autem et cum colore coloratum corpus'. Item, Gregorius Nixenus videtur sic diffinire: Visus est sensus qui 'in anterioribus cerebri secundum rectam lineam' accipit colorem et cum colore coloratum. Item, Avicenna sic: 'Visus est vis ordinata in nervo optico ad apprehendendum formam eius quod formatur in humore crystallino ex similitudinibus corporum habentium colorem, quae veniunt per corpora radiosa in effectum ad superficies corporum tersorum' ».

[17] Albertus Magnus, *De homine*, 1.1.1., ed. Söder 146.3-5 : « Contra primam diffinitionem videtur esse quod dicit Avicenna, scilicet quod 'primus sensuum propter quem animal est animal, est tactus ».

Dans sa réponse, Albert tâche de montrer que le sens de la vision a une primauté à l'égard de la compréhension, c'est-à-dire de la saisie des objets, alors que le sens du toucher a une primauté pour ce qui concerne la constitution de l'être animé. Il construit sa réponse en avançant tout d'abord la distinction fondamentale entre le sens de la vision et le sens du toucher. Par la suite, Albert explicite dans sa solution :

> 1. On doit dire donc, que le toucher c'est le premier sens, étant donné qu'il fait partie de la constitution de l'être animé ; mais la vision c'est le premier dans l'acte de saisir l'objet, comme on verra ci-dessous. […]
>
> Solution : On doit dire que le sens a une double comparaison, à savoir, par rapport au sens sensitif et par rapport au sens sensible ; le sensitif est rattaché à sa propre constitution ; le sensible est rattaché à l'acte de la connaissance. Et relativement au premier mode, le sens du toucher c'est le premier des sens, et le goût c'est le second, qui fait partie du sens du nourrisson, et d'une certaine manière, du toucher[18].

Étant donné que le sens de la vision a une primauté par rapport à l'acte de la connaissance de l'objet, et que le sens du toucher a une primauté à l'égard de sa constitution en tant qu'être animé, la question qu'il nous semble utile de poser est celle-ci : quelles sont les conséquences de cette position, en ce qui concerne les représentations, i. e. les schémas qui réalisent une visualisation du savoir ? La disposition du texte découle de la compréhension effectuée par l'auteur des matières développées. Cette disposition et la forme logique du texte peuvent être visualisées au moyen d'un diagramme qui nous fait voir le développement suivi.

> Par la suite, on doit passer aux questions sur l'homme. La première question s'interroge sur son propre état, et par après, sur sa place, qui est appelée le paradis. Sur son état, trois questions doivent être posées : la première est sur son âme, la seconde sur le corps et la troisième sur l'ensemble. Concernant la première question, il y a deux problèmes : le premier sur sa substance et sa nature ; le second, sur ses parties, sa division, ses passions et opérations, qui s'y produisent, comme le dit le philosophe dans le livre I du De anima : 'nous vou-

[18] Albertus Magnus, *De homine,* 1.1.1. (1), ed. Söder 146.54-56; 1.1.2. : « Dicendum ergo ad primum quod tactus est primus sensus in constituendo animal, sed visus est primus in apprehendendo, ut patebit inferius. (…); 148. 4-10: Solutio : dicendum quod sensus duplicem habet comparationem, scilicet ad sensitivum et ad sensibile : ad sensitivum in constituendo ipsum, ad sensibile autem in cognoscendo. Et secundum primum modum tactus est primus sensus et secundus gustus, qui est sensus alimenti et quidam tactus».

> lons d'abord examiner et connaître sa nature et sa substance, et ensuite les choses qui s'y produisent, dont certaines semblent être les passions propres à l'âme et d'autres celles qui sont communes, raison pour laquelle elle appartient aux êtres animés'. En ce qui concerne le premier point, trois questions se posent, à savoir, pourquoi devrait-il être débattu en premier lieu sur la substance de l'âme plutôt que sur ses parties, ou sur le corps, ou sur son tout ; si elle existe et quelle est sa définition substantielle et naturelle[19].

Voici le premier exemple, tiré du prologue de la première partie concernant la nature et substance de l'âme, dans le diagramme numéro un :

SCHÉMA VISUEL - DE HOMINE (1)
DE ANIMA IPSIUS
DE SUBSTANTIA ET NATURA EIUS
Sur l'homme
1. Sur son état
2. Sur sa place - paradis
1. Sur sa propre âme
2. Sur son corps
3. Le rapport des deux
Sa substance et nature
Ces parties, divisions et Passions et actions
QQ. Passions sont de sa nature
D'autres sont accidentels
Propres à elle
Communes aux autres êtres animés
L'âme at son état
La raison de discuter premièrement sa substance et nature
Si elle existe
Ce qu'elle est selon sa substance et nature

[19] Albertus Magnus, *De homine*, (prologue), ed. Söder, 1.1-13: «Consequenter transeundum est ad quaerendum de homine. De quo primo quaerendum est secundum statum eius in seipso et postea de loco eius, qui paradisus dicitur. Circa statum eius in seipso quaerenda sunt tria. Quorum primum est de anima ipsius, secundum de corpore, tertium de coniuncto. Circa primum quaerentur duo. Quorum primum est de substantia et natura eius; secundum autem de partibus ipsius et divisione et propriis passionibus et operationibus, quae accidunt illis, secundum quod dicit philosophus in I de anima: 'Inquirimus autem considerare et cognoscere naturam ipsius et substantiam, postea quaecumque accidunt circa ipsam. Quorum aliae quidem propriae passiones animae esse videntur, aliae autem communes, ex eo quod illa animalibus inest'. Circa primum quaeruntur tria, scilicet quare prius disputandum est de substantia animae quam de partibus eius vel de corpore vel coniuncto; et an sit; et quid sit secundum substantiam ipsius et naturam». Dans l'édition de Borgnet, Albertus Magnus, *Summa de creaturis, secunda pars, quae est de homine* (Opera omnia, vol. 35), ed. A. Borgnet, Parisiis, 1896, 1-661, la disposition du traité est différente, comme on a déjà signalé plus haut : il est divisé en des questions et articles, mais les prologues sont conservés. Dans cette édition, la question I est consacrée à la nature et substance de l´âme.

Ce diagramme montre au départ du commentaire une division à la fois verticale et horizontale. Il présente le thème de la deuxième partie de la *Summa de creaturis*, qui concerne l'homme. La seconde division, qui concerne l'âme et son état, n'est qu'une subdivision de la première qui elle-même distingue dans l'homme d'une part l'âme et son état et de l'autre la place de l'homme au paradis.

Le deuxième exemple est repris du début de la deuxième partie de la section sur l'âme sensible. Chaque prologue donne une vision d'ensemble, tout en éclairant la succession des thèmes qui vont apparaître.

> Ensuite, nous devons traiter des questions qui se rapportent aux parties de l'âme, sur sa division et sur ses passions et les opérations qui s'y produisent. Et comme la division semble montrer, en dernier, sa substance, il faut d'abord faire une recherche sur celle-ci. Et comme l'un est indivisible en soi-même, on s'interroge premièrement si l'âme est une ou multiple dans tous les êtres animés. Et s'il y a plusieurs âmes, il est question de savoir si elles furent créées par comparaison avec les étoiles, comme le dit Platon, ou bien si elles sont créées dans le corps et se multiplient. Et si elles furent créées dans le corps, si elles furent créées par Dieu de manière immédiate ou par les intelligences angéliques, comme certains philosophes le disent.
>
> Par après il faut examiner la question sur la division de l'âme à travers ses distinctions : végétative, sensible et rationnelle, et de quelle manière cette division est faite, et si elle est suffisante ou non ; si elle peut être divisée en âme rationnelle et irrationnelle, telle qu'on la distingue dans l'animal. Et dans la suite, si ces trois différences de l'âme sont une substance dans un être animé ou pas ; et s'il existe plusieurs âmes dans tout être animé ou non. Et finalement, on doit examiner le caractère singulier de ces différences[20].

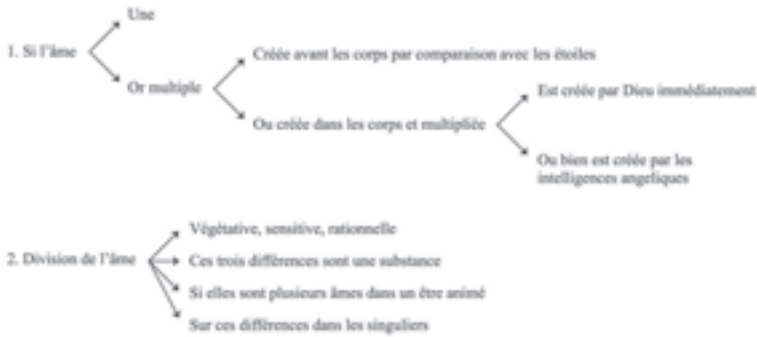
[20] Albertus Magnus, *De homine*, (prologue), ed. Söder, 57.4-15 : «Deinde transeundum est ad quaestiones quae sunt de partibus animae et de divisione et propriis passionibus et operationibus, quae accidunt illis. Et quia divisio videtur manifestare substantiam ipsius per posteriora, quaerendum est primo de ipsa. Et quia unum indivisum est in se, quaeratur primo, utrum anima sit una vel multae in omnibus animatis. Et si multae, quaeratur, utrum ante corpus fuerint creatae in comparibus stellis, ut dicit Plato, vel in corpore sint creatae et multiplicatae. Et si in corpore sint creatae, utrum immediate creentur a deo vel ab intelligentiis angelicis, sicut videntur dicere quidam philosophorum. Postea vero consequenter quaerendum est de divisione animae per has differentias vegetabile, sensibile et rationale, qualis scilicet sit ista divisio ; et utrum sit sufficiens vel non ; et utrum dividi possit anima per rationale et irrationale, sicut dividitur animal. Et consequenter utrum istae tres differentiae animae sint una substantia in aliquo uno animato, vel non ; et utrum in quolibet animato sint plures animae, vel non. Et tamdem quaerendum est de singulis istarum differentiarum».

Ce prologue énonce l'ensemble des questions sur l'âme en général. Les distinctions recouvrent la plus grande partie du commentaire consacrée à l'âme et à ses distinctions aristotéliciennes. Le diagramme numéro deux aura une suite dans le diagramme numéro trois. Les prologues mettent en évidence un enchaînement des distinctions. Voici le diagramme numéro deux :

SCHÉMA VISUEL (2)

[DE PARTIBUS ANIMAE ET DE DIVISIONE ET PROPRIIS PASSIONIBUS ET OPERATIONIBUS, QUAE ACCIDUNT ILLIS]

UTRUM ANIMA SIT UNA VEL MULTAE IN OMNIBUS ANIMATIS


1. Si l'âme
Une
Or multiple
Créée avant les corps par comparaison avec les étoiles
Ou créée dans les corps et multipliée
Est créée par Dieu immédiatement
Ou bien est créée par les intelligences angéliques
2. Division de l'âme
Végétative, sensitive, rationnelle
Ces trois différences sont une substance
Si elles sont plusieurs âmes dans un être animé
Sur ces différences dans les singuliers

Le troisième schéma est repris de la section qui concerne l'âme sensible, plus particulièrement les sens extérieurs. Le prologue énonce le problème et présente ces distinctions au niveau du sens.

> Par la suite, nous devons passer à l'âme sensible. Et premièrement il est nécessaire discuter ses parties, puis l'âme en général. Mais, puisqu'une de ces parties est celle qui saisit et l'autre celle qui se meut, et que la partie qui saisit est antérieure à celle qui se meut, il faut chercher tout d'abord celle qui concerne la connaissance perceptible et par après celle qui concerne son mouvement. Mais, puisqu' il y a encore dans la partie qui saisit l'une qui est une connaissance externe et l'autre une connaissance interne, nous devons tout d'abord considérer la connaissance externe et ensuite la connaissance interne. Sur le sens en lui-même, il faut le traiter de deux manières, soit sur chacun individuellement et sur tous en général, soit comment chacun des sens est capable de saisir les espèces sensibles devant la matière sans matière. Mais les sens sont au nombre de cinq, à savoir, la vue, l'ouïe, l'odorat, le goût et le toucher. Il faut donc s'enquérir d'abord de la vue. Et nous posons quatre questions, à savoir, pourquoi la vue

est considérée comme le premier des sens, et ce qu'est la vue ; deuxièmement, la vue de la part de l'organe ; troisièmement la vue de la part de l'objet et du milieu ; quatrièmement, sur le mode de la vue et l'acte de voir. Par rapport au premier on pose deux questions, ce qu'est la vue et pourquoi elle est la première des sens[21].

SCHÉMA VISUEL (3)
DE ANIMA SENSIBILIS
DE PARTIBUS EIUS APPREHENSIVIS DEFORIS
L'âme sensible et les parties
De la saisie extérieus
L'âme en générale
L'âme et ses parties
La partie perceptive
La partie du movement
Extérieure
Intérieure
Sens propre
Sens commun
Chacun des sens
En commun avec tous
Le sens de la vue
1. Ce qu'est le sens de la vue et pourquoi le premier
2. La vue de la partie de l'organe
3. La vue de la partie de l'objet et du milieu
4. Du mode et de l'acte de voir

Ce troisième schéma exploite le problème de l'âme concernant sa partie perceptive et la question majeure concerne la primauté donnée au sens de la vue. Les cinq sens sont évalués en eux-mêmes et aussi en

[21] Albertus Magnus, *De homine*, (prologue), ed. Söder, 145.3-18 : «Deinde transeundum est ad animam sensibilem. Et primo disputandum est de partibus eius, et postea de ipsa in communi. Sed quia partium quaedam est apprehensiva, quaedam motiva, et apprehensio praecedit motum, quaerendum est primo de apprehensiva, et postea de motiva. Quia vero iterum apprehensivarum quaedam est apprehensiva deforis, quaedam vero deintus, prius quaerendum est de apprehensiva deforis, et postea de apprehensiva deintus. Sed quia iterum apprehensiva deforis duplex est, scilicet sensus proprius et sensus communis, ideo prius quaerendum est de sensu proprio, et postea de communi. De sensu vero proprio dupliciter agendum est, scilicet singillatim de unoquoque, et in communi de omnibus, scilicet qualiter quilibet sensus susceptivus sit sensibilium specierum praesente materia sine materia. Sensus autem proprius quintuplex est, scilicet visus, auditus, odoratus, gustus et tactus. Quaerendum est igitur primo de visu. Et quaeruntur quattuor, scilicet quare visus ponatur primus sensuum est quid sit visus ; secundo de visu ex parte organi ; tertio de visu ex parte obiecti et medii ; quarto de visu ex parte modi et actus videndi. Circa primum quaeruntur duo, scilicet quid sit visus, et quare ponatur primus sensus».

fonction de l'ensemble. Le sens de la vue est analysé dans sa nature interne et externe, et l'analyse approfondit la nature des *species visibiles* produites grâce aux rayons de lumière qui proviennent soit de l'œil humain, soit du milieu.

2. Les diagrammes géométriques et les species visibiles

Dans la suite de son exposé sur l'âme perceptive qui recourt aux sens extérieurs, Albert reproduit des diagrammes géométriques qui concernent la nature physique de la perception visuelle par rapport au milieu naturel, rendue possible grâce à la lumière et à ses rayons. En fait, la perception visuelle repose sur l'organe du corps, mais aussi sur la lumière qui fait voir. La vision est ainsi le produit par l'organe physique, mais également l'acte de connaître l'objet saisi par la lumière. Ces deux diagrammes que nous allons représenter ci-dessous décrivent tout particulièrement la constitution de la lumière (*lumen*) comme partie de l'organe de l'œil et comme partie de l'acte de la connaissance. Si l'œil est décisif dans le processus de la vision, car il émet des rayons de lumière qui lui permettent de voir, la vision s'étend dans un milieu qui est lumineux. C'est dire que les rayons se trouvent soit du côté du sujet, soit du côté de l'objet, en ce qu'il fait partie de la nature et dans la mesure où il est inscrit dans le *medium*. Un autre problème concerne la constitution de la vision de l'organe de l'œil et la manière dont elle s'étend à travers un *medium,* permettant ainsi reproduire la vision et la connaissance d'une *species visibilis* : c'est le problème de la réfraction de la lumière en milieu lumineux. Par ailleurs il faut aussi comprendre de quelle manière se produit la *species sensibilis.*

Dans la question 1.3 : *de visu ex parte obiecti et medii*, il s'agit d'expliciter en quoi consiste la lumière qui, étant un moyen diaphane, reste cependant problématique quant à sa nature substantielle, à la fois physique et métaphysique[22]. Quelle est la nature de la lumière, celle qui est dans le corps visible, et celle qui se trouve dans les étoiles et dans les astres. (1.3.1). De plus, cette lumière s'étend jusqu'au domaine spirituel.

> Certains affirment que la lumière est un corps, et il y a de nombreux petits corps rayonnants qui en descendent jusqu'à l'air et à la terre

[22] La question 1.3.1. *Utrum lumen quod descendit a corporibus luminosis sit substantia vel accidens* .3.1, 153.35 met en évidence le problème de savoir si la lumière émanant des corps lumineux est une substance ou un accident.

> sont illuminés. D'autres considèrent que la lumière est une substance spirituelle en arrivant à celui qui est illuminé sans aucune forme de corruption dans le diaphane, comme l'âme survient au corps sans qu'elle soit corrompue par une forme quelconque dans le corps organique physique ayant la vie en puissance [23].

Pour aboutir à une compréhension de la vision de la partie de l'organe, Albert expose en quoi consiste la capacité visuelle mise en acte par l'œil. Il affirme que la vision dans la partie de l'organe de l'œil se fait en milieu aqueux ou en milieu lumineux, en évoquant, à ce propos, une polémique entre Platon et Aristote[24]. L'analyse est très minutieuse ; elle tâche de monter l'importance de la lumière et des rayons qui sortent de l'organe visuel afin de rendre visible le monde extérieur. L'argument est tiré du *Timée* : « Le rayon intérieur est joint au rayon extérieur et ils s'achèvent dans le sensible ; les rayons reflétés en mouvement rectiligne retournent à l'œil et en revenant intérieurement à l'âme, ils produisent la vision »[25]. Dans cette question qui porte sur la vue du côté de l'organe, s'il est humide ou un rayon lumineux, Albert se demande si la consistance de l'œil tient uniquement à une lumière aqueuse ou bien humide. Albert reprend l'argument d'Aristote opposé à Empédocle tel que le *Timée* le présente : les rayons de l'œil sont la seule source de vision et de lumière : "quand la lumière émet ses rayons jusqu'à l'illumination du diaphane, comme la lumière sort de la lampe, il se pourrait alors que la lumière en sortant de l'œil illumine le milieu ; elle pourrait alors permettre de voir les couleurs dans les ténèbres, ce qui est faux"[26].

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[23] Albertus Magnus, *De homine*, 1.3., ed. Söder, 159.61-68 : « Quidam enim dicunt quod lux est corpus, et sunt multa corpora parva radiosa descendentia in aërem et terram, quae illuminantur. Quidam autem dicunt quod lux est substantia spiritualis adveniens ei quod illuminatur sine corruptione alicuius formae in diaphano, sicut anima advenit corpori praeter hoc quod corrumpat aliquam formam in corpore organico physico potentia vitam habente ».

[24] Albertus Magnus, *De homine*, 1.2., ed. Söder, 148.35-38 : « Deinde quaeritur de visu ex parte organi, scilicet utrum consistentia oculi sit tantum in humido aqueo vel igneo luminoso. De hoc enim altercatio est inter Aristoteles et Platonem et sequaces eorum. »

[25] Albertus Magnus, *De homine*, 1.2., ed. Söder, 149.9-12 : «Item, in Timaeo Platonis dicitur quod radius interior coniungitur radio exterior et terminantur ad sensibile et repercussi motu recto redeunt ad oculum et recurrentes interius ad animam operantur visum ».

[26] Albertus Magnus, *De homine*, 1.2., ed. Söder 149.56-60 : «… cum ignis emittat radios ad illuminationem diaphani sicut 'lumen egrediens de lucerna, accideret tunc

Le milieu est, lui aussi, source de lumière et c'est grâce à ce milieu que l'objet est vu et perçu. Par ailleurs, Albert discute[27] la nature de la vision de l'œil : est-ce que l'œil est tout à fait dominé par la lumière (*ignis*), ou bien il est plutôt dominé par l'humidité (*humor*) c'est-à-dire par l'eau ?. La réponse vient surtout d'Aristote[28]. Il y a d'un côté le rayon qui sort de la vision et qui permet de saisir quelque chose, et il y a le milieu cristallin et diaphane de l'autre, qui permet que la vision s'accomplisse. Selon le maître de Cologne la lumière qui est dans l'œil ne peut pas dominer la vision de l'organe, dans la mesure où il est en partie constitué par l'eau qui se rapporte à ce qui est produit par l'impression.

Pour montrer cela, le maître de Cologne présente plusieurs diagrammes qui se rapportent à la vision faite par l'œil humain et qui s'étend en milieu lumineux. Les *species visibiles* sont produites soit

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lumen egrediens ab oculo illuminare medium, et secundum hoc contingeret colores videri in tenebris', quod falsum est ».

[27] Albertus Magnus, *De homine*, 1.2., ed. Söder, 151. 33-47 : « Solutio: Dicimus quod in oculo dominatur aqua quantum ad illa partem, in qua fit impressio. Est enim in oculo duplex humor. Quorum unus est in acie, qui dicitur crystallinus propter puritatem, et glacialis sive grandinosus propter frigidum complexionale dominans in ipso, quia, sicut dicit Philosophus, oculus est ita frigidus quod servata complexione non infrigidatur amplius, et ideo in temporibus et locis, in quibus infrigidantur oculi supra temperamentum, generatur obscuritas visus. Et hoc patet ex hoc quod diu ambulantibus in nive vel glacie vel aqua et mari obscura apparent loca nivium et glaciei et ripae aquarum et littora marium. Alius humor est post illum in textura venarum, qui habet colorem vitri aliquantulum vergentis ad ruborem, et ideo a quibusdam philosophis dicitur vitreus ».

[28] Albertus Magnus, *De homine* 1.2., ed. Söder, 150-151.56-73;1-4 : «Quod si in oculo dominaretur ignis, a quo exirent radii, oporteret 'visum in radiis illis extendi usque ad astra, quae videmus, et oporteret ipsum per radium prodeuntem ex oculo per radios coadhaerere' omnibus visibilibus. Et ex hoc sequeretur quod virtus visiva extenderetur extra oculum, quod est inconveniens, cum nulla virtus extendatur per essentiam extra proprium subiectum. Praeterea, inconveniens est dicere exterius lumen coniungi interiori ; nulla enim coniunguntur, quorum aliquid est medium. Sed inter extrinsecum et intrinsecum tunicae oculi intersunt, quae a philosopho miringae dicuntur. Praeterea, in omni figurato corpore et animato necesse est secundum naturam dominari elementum receptibile illius figurae; sed oculus est figuratum corpus; ergo necesse est in ipso dominari elementum receptibile illius figurae. Ignis autem et aër non sunt corpora receptibilia figurarum propter sui spiritualitatem; ergo in oculo non dominabitur alterum horum, sed terra vel aqua. Sed non terra, quia ipsa non est perspicua; ergo relinquitur quod aqua dominetur in oculo».

au moyen de l'œil, soit au moyen du *medium* tout en se produisant de façon différente. Celle qui est produite par l'œil humain est interne au sujet, alors que l'autre est externe. Reprenant Averroès, Albert expose :

> Á cause de cela, certains affirment que quand Averroès affirme que les espèces visibles sont dans le milieu comme dans l'être spirituel, il ne dit pas que l'esprit est un esprit non-corps, selon la manière que nous appelons esprit à l'âme, mais il dit que l'esprit est un corps subtil et lumineux, lequel est un instrument de l'âme en vue de la perfection des puissances des êtres vivants, selon ce qui est défini par Algazel dans sa Physique, où il dit ceci : 'l'esprit est un corps subtil composé par les vapeurs des humidités, dont le siège est le cœur ; il est le véhicule des puissances vitales et animées, au moyen duquel les capacités sensibles et motrices se transforment dans ses instruments' [29].

Tout le long de cette section (1.3.3. *De coloribus qui sunt obiecta visus in lumine*) qui porte sur la capacité de voir au moyen de l'œil humain d'un côté, et du milieu imprégné de lumière de l'autre, permettant de saisir les objets, amène à des conclusions qui sont à la fois anthropologiques et métaphysiques. Une de ces conclusions semble nuancer la distinction entre le corps et l'esprit. Une autre conclusion, c'est que les définitions ou les propositions de l'optique géométrique ne peuvent pas répondre aux questions de l'ordre spirituel et de l'être animé.

3. Géométrie et lumière

Au sujet de la vision en tant que partie de l'objet et du *medium* (*De visu ex parte obiecti et medii*), Albert propose cinq articles[30], mais sa

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[29] ALBERTUS MAGNUS, *De homine*, 1.3.5., SÖDER, 182.22-36 : « Propter hoc quidam volunt dicere quod quando dicit Averroes quod species visibiles sunt in medio ut in esse spirituali, quod non dicitur ibi spiritus secundum quod spiritus est non-corpus, secundum quem modum vocamus animam spiritum, sed dicitur ibi spiritus corpus subtile et lucidum, quod est instrumentum animae ad perfectionem virtutum animalium, secundum quod spiritus diffinitur ab Algazele in sua physica, ubi dicit sic : 'Spiritus est corpus subtile compositum ex vaporibus humorum, cuius sedes est cor, et ipse est vehiculum virtutum vitalium et animalium per quem virtutes sensibiles et motivae transeunt in sua instrumenta'. Dicunt igitur quod quia ille spiritus connaturalis est aëri, ideo etiam aër secundum potestatem illius spiritus recipit species sensibiles ».

[30] ALBERTUS MAGNUS, *De homine*, 1.3., ed. SÖDER, 153.25-33 : « Consequenter quaerendum est de visu ex parte obiecti et medii. Sed quia lumen est actus utriusque, ideo etiam necesse est hic quaerere de lumine. Circa hunc igitur articulum quaeruntur quinque. Quorum primum est de lumine ; secundum de noctilucis, quae sunt obiecta visus in tenebris ; tertium de coloribus qui sunt obiecta visus in lumine ; quartum de

manière de développer les questions dans chaque article n'est pas habituelle. En réalité, les questions ne sont pas vraiment des articles, car plusieurs de ces questions présentent une subdivision. La distribution est la suivante :

1. La question : en quoi consiste la lumière (1.3.1)
2. La question des lumières de nuit et les objets perçus dans les ténèbres (1.3.2.)
3. La question de la couleur : les objets perçus dans la lumière (1.3.3 ; 1.3.3.1. ; 1.3.3.2. ; 1.3.3.3.)
4. La question du medium au moyen duquel on peut voir (1.3.4.)
5. Comment les *species visibiles* existent-elles dans le milieu (medium) (1.3.5. ; 1.4.)

Ces questions se rapportent aussi au diagramme numéro trois, compte tenu de la subdivision du sens de la vue et les quatre questions posées sur celui-ci en tant que premier des sens. Le parallélisme que nous posons est démonstratif de la méthode exégétique et dialectique d'Albert le Grand. Ces distinctions successives peuvent s'accorder et se compléter.

La question numéro cinq pose précisément le problème de la constitution de la *species visibilis* soit dans le milieu (*medium*), soit dans l'œil. Les autorités convoquées sont nombreuses : Platon, Aristote, Calcidius, Grégoire de Nysse, Augustin, Isaac Israeli, Averroès, Algazel, Avicenne, Alfarabi, Euclide, et beaucoup d'autres, qui sont introduits dans le cours de l'exposition, qui ne sont pas nommés mais qui sont désignés par les formules « Quidam dicunt » ou bien « alii vero dicunt ».

Le premier diagramme géométrique est représentatif de ce que nous venons de dire. Il s'agit du rapport entre la vision, le mouvement, la lumière et la position spatiale occupée dans la circonférence par l'œil humain eu égard la couleur. Le mouvement en ligne droite à l'intérieur de la circonférence est mis en rapport avec la couleur blanche et noir,

> Divisez un cercle par son diamètre et considérez les points de contact du diamètre A et B; soit D le mobile en mouvement de A à B au moyen d'un demi-cercle, et qui passe par B et avance en A au moyen du demi-cercle ; tenez alors C comme mobile de A à travers l'autre demi-cercle et en passant par B il arrive en A. Ces deux mouvements

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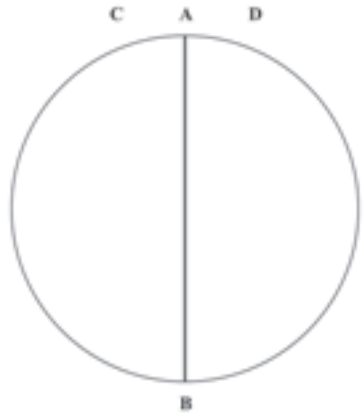
natura medii, per quod est visus ; quintum et ultimum, qualiter species visibiles sunt in medio ».

> arrivent eux-mêmes en B, et l'un s'arrête au mouvement de l'autre, c'est pourquoi ils sont placés en position opposée de la circonférence. De la même manière donc il sera en mouvement rectiligne. Si donc, le blanc se tourne vers l'œil de quelqu'un qui vient du levant, et le noir vers l'autre œil qui décline, et le blanc et le noir sont au milieu comme dans le mouvement, comme certains l'affirment, par nécessité un mouvement de l'un restera le mouvement de l'autre et ainsi chacun de l'œil deviendra changeable, car l'un ne permet à l'autre d'aller à l'œil de l'autre [31].



Il semble que dans cette question sur l'espèce visible produite par l'œil humain et par le mouvement d'un corps dans un cercle, Albert s'appuie sur les théorèmes 41 et 42 de *l'Optique* d'Euclide qui exposent le trajet du rayon de l'œil s'étendant vers le centre du cercle, et comment ce trajet est fait en ligne droite et plat, ou bien est égal au demi-diamètre de l'œil qui voit. Ce qui distingue le diagramme d'Albert de ceux qui sont représentés dans les théorèmes d'Euclide, c'est le fait qu'il introduit un autre problème qui complexifie la constitution de l'espèce visible : la couleur et son rapport avec la lumière. Pour exemplifier

[31] Albertus Magnus, *De homine*, 1.3.5., ed. Söder, 183.4-17 : « Dividatur enim circulus per diametrum et sint puncta contactus diametri A et B ; et D sit mobile motum ex A in B per unum semicirculum, et transeat per B et vadat in A per alium semicirculum ; C autem sit mobile ex A per alium semicirculum et transeundo per B veniat in A. Ista duo mota ocurrent sibi in B, et unum sistet motum alterius, eo quod sunt ad situs oppositos circumferentiae ; ergo similiter erit in motu recto. Si igitur album immutat versus orientem oculum aliquem, et nigrum versus occidentem oculum alium, et album et nigrum sunt in medio sicut in motu, ut dicunt illi, de necessitate motus unus sistet alterum, et sic neuter oculus immutabitur, quia unus non permittet alium transire ad oculum ».

cela, Albert introduit la couleur blanche et la couleur noir par rapport aux mouvements de l'œil, l'un qui vient du levant et l'autre qui décline dans les points opposés du diamètre de la circonférence. Les positions de l'un et l'autre l'œil, pris à des points opposés dans la circonférence deviendront changeables.

Le deuxième diagramme met en rapport l'optique et la géométrie. Albert utilise la *Physique*, 261 b 2 d'Aristote, mais l'*Optique* et la *Catoptrique* d'Euclide[32] sont ici très importantes.

Le maître de Cologne tâche de montrer que le cercle n'admet pas des contraires. D'autre part, il engage le débat avec la position d'optique d'un sujet face à des positions géométriques différentes. Pour l'optique "l'œil est supposé émettre un cône de rayons visuels qui vont percevoir à distance les objets éclairés et enregistrent leurs couleurs, leurs positions, leurs grandeurs et leurs formes"[33]. Albert parle des images convexes, produites par le sujet grâce à la vision, et qui ne sont pas uniquement le résultat de la perception de l'objet. D'où la définition reprise à Euclide : « l'œil est d'une certaine manière un miroir animé »[34].

Cette deuxième figure est plus complexe, car elle vise le rapport entre la vision produite par œil grâce aux rayons qu'il émet, et la transformation que l'œil subit à partir du milieu face à l'objet visible. L'objection principale est de dire que le corps humain empêche le changement, car le changement est fait par rapport à la ligne droite. Le schéma ci-dessous, veut faire la démonstration :

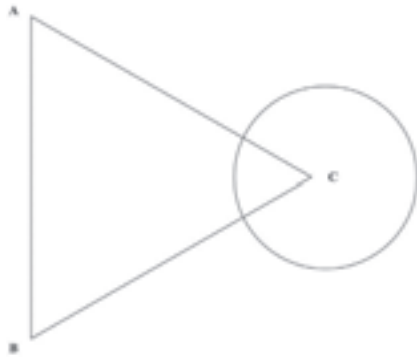
> Prenons le triangle ABC, dont la base est derrière nous, plus longue que la largeur de notre corps et soit AB. Et ses côtés, à savoir, AC et BC, se touchent au point C sous nos yeux. Par conséquent, puisque le changement a lieu le long de ces lignes qui sont droites, l'air sera changé jusqu'à C, et l'air changé changera l'air à chaque partie le long de la circonférence. Que l'on place donc un cercle sur le point C, dont la circonférence touche l'œil, derrière lequel est la base du triangle ; donc cet œil verra la couleur placée en A et la couleur pla-

[32] La catoptrique est une discipline de l'optique géométrique qui apparaît avec Aristote, et qui devient une discipline autonome des mathématiques appliquées avec Euclide et Ptolémée. L'optique est une partie de la physique.

[33] A. Lejeune, *Recherches sur la Catoptrique grecque d'après les sources antiques et médiévales*, Bruxelles 1957, 3.

[34] Albertus Magnus, *De homine*,1.3.3.3, ed. Söder, 175.6 : « oculus est quoddam speculum animatum ».

cée en B, ce qui est faux. Par conséquent il semble qu'il n'y a aucun changement d'air en direction de toute partie[35].



Au travers de cet exemple Albert veut corriger les propositions 1 et 2 de la *Catoptrique* d'Euclide par rapport au changement qui se produit en ligne droite entre deux spectateurs placés en des positions différentes[36]. Le maître de Cologne révèle une véritable connaissance scientifique, notamment mathématique, attestée par son commentaire aux *Eléments d'Euclide*[37].

Conclusion

Albert est connu comme le *Doctor Universalis,* et cette désignation est tout à fait juste. Bien au-delà des questions théoriques et strictement philosophiques, il s'engage dans une réflexion qui touche à des domaines spécifiques, tels que la mathématique, la géométrie et l'optique.

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[35] Albertus Magnus, *De homine*, 1.4., ed. Söder, 188.1-12 : « Sumatur triangulus ABC, cuius basis sit retro nos longior latitudine corporis nostri et sit AB. Latera autem eius, scilicet AC et BC, contingant se in puncto C ante oculos nostros. Cum ergo immutatio fiat secundum illas lineas, quae rectae sunt, immutabitur aër usque in C, et aër immutatus immutat aërem ad omnem partem per circunferentiam. Ponatur ergo circulus super punctum C, cuius circumferentia tangat oculum, retro quem est basis trianguli ; ergo ille oculus videbit colorem positum in A et colorem positum in B, quod falsum est; ergo non videtur fieri immutatio aëris ad omnem partem ».

[36] Euclides *Opera o*mnia, vol. VII, ed. I. L. Heiberg et H. Menge, Lipsiae 1895, 286.

[37] A. Bello, «Albertus Magnus and Mathematics. A translation with Annotations of those portions of the commentary on Euclid's Elements published by Berhard Geyer», in *Historia Mathematics* 10 (1983), 3-23.

Les diagrammes mis en évidence dans ce qui précède manifestent la démarche originale du maître de Cologne par rapport au modèle scolastique. L'analyse des prologues montre qu'Albert cherchait à mettre en place une *divisio textus* qui permette de saisir la logique interne de son exposé. Cette *divisio* en forme d'arbre horizontal trouve sa cohérence et son accomplissement lorsque nous analysons les diagrammes géométriques mis en place et qui reprennent l'optique géométrique d'Euclide en y adjoignant une réflexion propre. La nature des *species visibiles* et leur constitution par l'œil et par le milieu entraînent des conséquences non seulement d'ordre physique mais aussi anthropologiques et métaphysiques. En effet, l'acquisition des formes sensibles est faite selon l'être spirituel, avec le concours des sens externes et internes du sujet, c'est-à-dire du mode de voir du sujet, mais également avec le concours de la constitution du milieu. Ce milieu s'avère assez complexe, doté d'un ensemble de propriétés qui permettent la vue et la connaissance, tels que : les rayons de lumière, la position et la réfraction de ces rayons, le changement de position du spectateur et la nature de la propagation de la lumière dans le milieu, c'est-dire par l'air, par l'eau ou par un autre élément naturel. La visibilité dépend de plusieurs conditions sur lesquelles Albert réfléchit longuement : *oculus est figuratum corpus*[38] et s'il en est ainsi, l'œil signifie à la fois le corps visionné et représenté, et ce qu'on visionne et représenté.

Universidade Católica Portuguesa

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[38] Albertus Magnus, *De homine*, 1.2., ed. Söder, 150.71.

John Pouilly and John Baconthorpe on Reflex Acts

Peter John Hartman

Sometimes I reflect upon my own thoughts. For instance, I am thinking about the rose on my table and also, for the purpose of writing this paper, taking a step back and reflecting upon the thought that I am having about that rose. Using the scholastic terms, I am eliciting a reflex act (*actus reflexus*) about a present direct act (*actus rectus*) about the rose. Call this *mental reflection properly so-called (MRP)*.[1]

Broadly speaking, during the High Middle Ages (1250–1350) there were two theories about MRP depending on whether or not we take the reflex act to be identical with the direct act. According to *the identity theory*, the direct act and the reflex act that concerns it are numerically one and the same act.[2] This is the view that John Pouilly (1312) defends.[3]

[1] The qualification 'present' is meant to distinguish MRP from a situation wherein I am remembering a past act. We might add some further qualifications. (1) The reflex act must be non-inferential. This distinguishes MRP from a case where I infer my own or someone else's mental act. (2) The acts must both belong to the same person. This distinguishes MRP from the peculiar case of mind-reading. On angelic mind-reading in this context, see S. Schierbaum, "Ockham on Awareness of One's Acts: A Way Out of the Circle", in *Society and Politics* 12,2 (2018), 8-27. (3) The direct act must be thought about in a 'concrete' or 'determinate' as opposed to 'abstract' or 'indeterminate' mode, that is, as my thought and not just *some* thought. This distinguishes MRP from thoughts about thought in general or in the abstract.

[2] As opposed to specifically or generically the same. In what follows, I drop the qualification 'numerically'.

[3] Iohannes de Polliaco, *Quodlibeta*, V, q. 7, ed. T. Jeschke, *Deus ut tentus vel visus. Die Debatte um die Seligkeit im reflexiven Akt (ca. 1293–1320)*, Leiden 2011, 683-708. Pouilly's *Quodl*., V, q. 7 is also paraphrased and discussed in Prosper de Reggio Emilia, *In primum Sententiarum*, d. 1, q. 3, qla. 2, Città del Vaticano, Biblioteca Apostolica Vaticana, Cod. Vat. lat. 1086, ff. 81va-82va, and Iohannes de Baconthorpe, *In primum Sententiarum*, d. 1, q. 1, ed. Jeschke, 591-611. Other proponents of the view include Durandus de Sancto Porciano, *Quaestiones de libero arbitrio*, q. 3, ed. P. Stella, "Le 'Quaestiones de libero arbitrio' di Durando da S. Porciano", in *Salesianum* 24 (1962), 471-499; Petrus de Palude, *Quodl*., qq. 6, 9 and 11, Toulouse, Bibliothèque Munici-

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According to *the distinction theory*, they are two distinct acts. Guy Terrena (1313)[4] and John Baconthorpe (ca. 1325)[5] defend different versions of this view. According to Guy, the direct act and the reflex act concerning it are two distinct *simultaneous* acts. Call this *the simultaneous distinction theory*.[6] However, such a view violated a generally accepted principle

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pale, Cod. 744, ff. 101ra-105rb (and 117rb-118vb), ff. 110rb-111va, and ff. 113ra-117rb; *In primum Sententiarum*, d. 1, q. 1, a. 3, ed. Jeschke, *Deus ut tentus vel visus*, 743-747; *In quartum Sententiarum*, d. 49, q. 4, a. 3, ed. Jeschke, 780-789; and arguably Thomas Aquinas. On Durand, see P. J. Hartman, "Durand of St.-Pourçain on Reflex Acts and State Consciousness", in *Vivarium* 59,3 (2021), 215-240; D. Perler, "Are Reflexive Acts Possible? A Late Medieval Controversy", in *Miroir de l'amitié. Mélanges offerts à Joël Biard à l'occasion de ses 65 ans*, ed. C. Grellard, Paris 2017, 213-226; and C. Girard, "Reflexivity Without Noticing: Durand of Saint-Pourçain, Walter Chatton, Brentano", in *Topoi* 41 (2022), 111-121. On Aquinas, see T. S. Cory, *Aquinas on Human Self-Knowledge,* Cambridge 2014, 134-173 and the references therein.

[4] Guido Terreni, *Quodlibeta*, I, q. 14, ed. R. Friedman, "On the Trail of a Philosophical Debate: Durand of St. Pourçain vs. Thomas Wylton on Simultaneous Acts in the Intellect", in *Philosophical Debates at Paris in the Early Fourteenth Century*, ed. S. F. Brown, T. Dewender, and T. Kobusch, Leiden 2009, 458-461.

[5] Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, ed. Jeschke, *Deus ut tentus vel visus*, 591-611.

[6] Such a theory will see its advocates with Prosper de Reggio Emilia, *In I Sent*., d. 1, q. 3, qla. 1, Città del Vaticano, BAV, Cod. Vat. lat. 1086, ff. 79ra–81va; Guillelmus de Ockham, *Quaestiones in librum secundum Sententiarum (Reportatio)*, q. 17, ed. G. Gál and R. Wood (Opera theologica 5), St. Bonaventure, NY 1981; *Quodlibeta septem*, I, qq. 12 and 17, ed. J. Wey (Opera theologica 9), St. Bonaventure, NY 1980; Adam de Wodeham, *Lectura secunda in librum primum Sententiarum: prologus et distinctio prima*, Prol., q. 2, ed. R. Wood and G. Gál, St. Bonaventure, NY 1990; and Guillelmus Crathorn, *Quaestiones in primum librum Sententiarum*, q. 2, ed. F. Hoffmann, Münster 1988. Indeed, S. Knebel, "Durand, Quirós, Consciousness", in *Durand of Saint-Pourçain and His Sentences Commentary: Historical, Philosophical, and Theological Issues*, ed. A. Speer et al., Leuven 2014 argues that the simultaneous distinction theory will win the day among later scholastic authors. On Ockham, see C. Rode, *Zugänge zum Selbst: innere Erfahrung in Spätmittelalter und Früher Neuzeit*, Münster 2015, 223-248; L. D. Gamboa, "Can We Reflexively Access the Contents of Our Own Perceptions? Ockham on the Reflexive Cognition of the Contents of Intuitions", in *British Journal for the History of Philosophy* 27,5 (2019), 921-940; S. Brower-Toland, "William Ockham on the Scope and Limits of Consciousness", in *Vivarium* 52,3-4 (2014), 197-219; S. Brower-Toland, "Medieval Approaches to Consciousness: Ockham and Chatton," in *Philosophers' Imprint* 12,17 (2012), 1-29; Schierbaum, "Ockham on Awareness"; and S. Schierbaum, "Ockham on the Possibility of Self-Knowledge: Knowing Acts without Knowing Subjects" in *Vivarium* 52,3-4 (2014), 220-240. On Wodeham, see C. Rode, *Zugänge zum Selbst*, 261-279.

in medieval psychology, namely, that a given mental power can have or elicit only one mental act at a given time.[7] Some, like Guy, were willing to abandon this principle. Others, like John Baconthorpe, were not so willing. However, rather than commit to some form of the identity theory, Baconthorpe maintains a version of the distinction theory. According to Baconthorpe, the direct act is distinct from the reflex act that concerns it, but these two acts do not occur at the same time. On this view, call it *the non-simultaneous distinction theory*, during an episode of MRP there is just one act that really exists (the reflex act). The direct act does not really exist. However, a representation of it does, and so the direct act can be said to exist at the same time as the reflex act 'objectively [*obiective*]', i.e., as a represented object.

As a first approximation, the identity theory is a kind of same-order theory of state consciousness, whereas the distinction theories are higher-order theories of state consciousness.[8] However, it will be important to distinguish between two kinds of state consciousness: reflexive and prereflexive. As I will be using these terms, reflexive state consciousness is explicit whereas prereflexive state consciousness is implicit.[9] As we will see Baconthorpe and Pouilly both take

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[7] See P. J. Hartman, "Durand of St.-Pourçain on Reflex Acts and State Consciousness", 217 and R. Friedman, "On the Trail" and the references therein.

[8] On these two theories, see, e.g., U. Kriegel, "The Same-Order Monitoring Theory of Consciousness", in *Self-Representational Approaches to Consciousness*, ed. U. Kriegel and K. Williford, Cambridge, MA 2006, 143-170 and D. Rosenthal, "Varieties of Higher-Order Theory", in *Higher-Order Theories of Consciousness: An Anthology*, ed. R. J. Gennaro, Amsterdam / Philadelphia 2004.

[9] Consider. I am so focused on the rose that I am not explicitly aware of my thinking about it, and yet, were you to ask me what I was just then doing, I would respond, "I was thinking about the rose." Assuming that I was somehow aware of my thinking about the rose before the question was posed, we would say that I was implicitly (prereflexively) aware but not explicitly (reflexively) aware of my thinking about the rose. For a general discussion of this distinction, see D. Zahavi, *Self-Awareness and Alterity: A Phenomenological Investigation*, Evanston, IL 1999, ch. 2. For a discussion of the distinction in the medieval context, see Cory, *Aquinas on Human Self-Knowledge*, 134-137. A particularly clear statement of the distinction can be found in Walter Chatton, who distinguishes between the prereflexive 'experience' of an act and the reflexive awareness of that act, arguing that reflex acts are only involved in the latter. See Gualterus de Chatton, *Reportatio et Lectura super Sententias: Collatio ad librum primum et prologus*, Prol., q. 2, a. 5, ed. J. Wey, Toronto 1989. On Chatton, see Brower-Toland, "Medieval Approaches"; Brower-Toland, "William Ockham on

themselves to be discussing reflexive state consciousness and view the reflex act as that in virtue of which we are reflexively aware of our mental acts.

In what follows, I will first go over the texts and context in which Pouilly and Baconthorpe discuss reflex acts. I will then present Pouilly's identity theory. Finally, I will present Baconthorpe's non-simultaneous distinction theory, as well as his arguments against Pouilly's identity theory.

Texts and Context

John and John develop their theories of reflex acts in the context of a theological discussion of happiness and the beatific vision. In *Quodl.,* V, q. 7, Pouilly wishes to maintain against John Quidort of Paris[10] that happiness primarily consists in a direct act of seeing God and not a reflex act.[11] In the middle of this discussion, he considers

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the Scope and Limits of Consciousness"; C. Rode, *Zugänge zum Selbst*, 249-260; and Girard, "Reflexivity Without Noticing."

[10] Iohannes Parisiensis Quidort, *In quartum Sententiarum*, d. 49, ed. Jeschke, *Deus ut tentus vel visus*, 613-623.

[11] See Jeschke, ch. 2 for a thorough discussion of Paris's view. Pouilly in fact considers (and rejects) two views that happiness consists in a reflex act. The first is Paris's view, according to which happiness consists in a reflex act *of the intellect* (reflexive vision) about a direct act *of the will* (holding God). Call this View A. View B maintains that happiness consists in a reflex act *of the intellect* (reflexive vision) about a direct act *of the intellect* (seeing God). Both views agree that the reflex act and the direct act are somehow one and the same act and that even so happiness *primarily* consists in the reflex act (or the act *qua* reflex). View B is attributed to Durand in the margins of the print edition of John Baconthorpe's *In I Sent*., d. 1, q. 1, Cremona, 1618, 48ra, where Baconthorpe is presenting (almost verbatim) Pouilly's discussion from *Quodl*., V, q. 7. Following this marginal suggestion, S. Knebel, "Durand, Quirós, Consciousness", 384, fn. 21 attributes the view to Durand. Durand does defend the claims that happiness consists in a reflex act of the intellect about a direct act of the intellect and that it primarily consists in the reflex act in his early treatment of happiness in *Scriptum super IV libros Sententiarum: distinctiones 1–3 libri primi*, ed. G. Guldentops, Leuven 2019, d. 1, q. 1 and *Scriptum super IV libros Sententiarum: distinctiones 43–50 libri quarti*, ed. Jeschke, Leuven 2012, d. 49, q. 5. (Note that this is the middle [B] redaction and that there is no extant witness to the earliest [A] redaction for these texts.) However, he remains (explicitly) neutral about the claim that in general reflex and direct acts are one and the same act in those texts. It is true that in his slightly later *QQ. de lib. arb*., q. 3 (1312 or 1313 and so plausibly simultaneous with or even prior to Pouilly's *Quodl*.,

the more general question of whether a reflex act is the same as a direct act.

While Pouilly, who held one of the 'secular' chairs of theology at the University of Paris from 1307 until 1312, harbored no particular institutional attachment to Thomas Aquinas,[12] in *Quodl*., V, q. 7 he notes (correctly) that one of (the Dominican) John of Paris's adequacy conditions, as it were, on a theory of happiness is that it conform with at least two claims that 'brother Thomas' seems to have put forward, namely, (1) that happiness consists in a 'vision', and (2) that it consists in 'one' act.[13] Paris, for reasons we need not go into, was convinced that happiness cannot consist merely in the *direct* vision of God. However, since Aquinas had stated that it consists in a *vision*, Paris concludes that it must consist in a *reflex* vision. Further, since Aquinas also maintained that happiness consists in just one act and not two, Paris decides that, in general, a reflex act is somehow (*aliquo modo*) identical with the direct act it concerns, and so Paris endorses some form of the identity-theory of reflex acts. John of Paris is fairly opaque about what it might mean to claim that the reflex act is 'somehow' one and the same as the direct act.[14] John Pouilly, however, is quite explicit about what this might

V, q. 7) Durand does defend this latter claim. However, I do not think Pouilly had Durand's position in mind. Pouilly introduces View B as a hypothetical position using the future tense (Id., n. 34, ed. Jeschke, 697: "one will argue [*aliquis arguet*]"). Moreover, the language he uses to characterize and defend the position is not similar to Durand's, and the arguments that he makes for this position cannot be found in Durand's texts. Hence, it seems to me that Pouilly is simply carving out the logical landscape, as it were: Paris had argued for View A; but one might argue for View B.

[12] Pouilly held the chair of Godfrey of Fontaines, whose views he defended vigorously. He was deeply influenced by (but antagonistic to) Henry of Ghent and the *Gandavistae*, and he (curiously) claimed that he was a student of Thomas Aquinas. See *Quodl*., I, q. 5, Paris, Bibliothèque Nationale de France, ms. lat. 15372, f. 10vb, as quoted in L. Hödl, "The Quodlibeta of John of Pouilly", in *Theological Quodlibeta in the Middle Ages. The Fourteenth Century*, ed. C. Schabel, vol. 2, Leiden 2007, 199, fn. 3. For the most recent biographical information on Pouilly, see C. Schabel, "Parisian Secular Masters on Divine Foreknowledge and Future Contingents in the Early Fourteenth Century, Part I: John of Pouilly's *Quaestio Ordinaria I*", in *Recherches de Théologie et Philosophie médiévales* 78,1 (2011), 161-219.

[13] See, e.g., Iohannes de Polliaco, *Quodl*., V, q. 7. nn. 6 and 12, ed. Jeschke, 688 and 689. For discussion of Aquinas and Pouilly on this issue, and texts in Aquinas where he seems to make these claims, see Jeschke, *Deus ut tentus vel visus*, ch. 2.

[14] Often, he just insists that they are one and the same act in a sui generis sort of way,

mean. While Pouilly rejects Paris's claim that happiness primarily consists in a reflex act, he accepts the claim that (in general) reflex acts and direct acts are the same act, and he spends quite a bit of time spelling out how this identity theory might work, and, further, how it could be that happiness primarily consists in the direct act granted that the direct and reflex acts are the same act.

John Baconthorpe's *In I Sent*., d. 1, q. 1 is, ostensibly, about whether our fruition concerns the ultimate end as a final cause. In the first two articles, however, he rehearses (often verbatim) Pouilly's discussion from *Quodl*., V, q. 7, spending the bulk of the second article on precisely the question of whether reflex and direct acts are the same. He also quotes from Durand's *QQ. de lib. arb.*, q. 3 (a single argument about motion which, Baconthorpe tells us, *clarifies* Pouilly's view)[15] and Guy Terrena's *Quodl*., I, q. 14, presenting Guy's objections (originally directed at Durand) as though they were objections to Pouilly's version of the identity theory.[16] He then sets out his own view.

John Pouilly's identity theory

John Pouilly's main argument for the identity theory is negative in character (*Quodl*., V, q. 7, nn. 35–42, ed. Jeschke, 697–700). While the argument is somewhat complex, we can perhaps simplify it as follows. A mental act can be said to be distinct from some other mental act only under certain conditions. But none of these conditions are met in the case of the direct act and the reflex act that concerns it during an episode of MRP. Hence, they must be one and the same act. I'll call this *the master argument*.

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namely, because the reflex act reflects upon the direct act. See, e.g., Iohannes Parisiensis Quidort, *In IV Sent*., d. 49, n. 19, ed. Jeschke, 621: "Tu arguis quod consisteret in duobus actibus. Dico quod sunt unum per reflexionem unius in alterum." See also Id., nn. 22-25, ed. Jeschke, 621-622.

[15] Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1., n. 31, ed. Jeschke, 603: "Hoc etiam alii declarant sic." Note that in the print edition (Cremona 1618, 49ra) this 'clarification' is attributed to Peter of Palude in the margin and the main text ("Hoc etiam declarat Petrus de Palude sic.") However, to my knowledge, this argument does not show up in the main places where Palude discusses this issue (see above footnote 3). Likely, Baconthorpe drew the argument from Guy's presentation of it in *Quodl*., I, q. 14., n. 4, ed. Friedman, 458.

[16] For these objections, see footnote 27 below.

1. A mental act X is distinct from a mental act Y if *either* (a) X and Y have distinct subjects, *or* (b) X and Y have (suitably) distinct objects, *or* (c) X and Y occur at distinct times.[17]

2. Not (a): The reflex act and the direct act it concerns have the same subject, e.g., the intellect. [The same-subject thesis]

3. Not (b): They have the same object. [The same-object thesis]

4. Not (c): They occur at the same time. [The simultaneity thesis]

In what follows I will look at how Pouilly justifies (2)–(4).

The same-subject thesis

Provided we are interested in *intellectual* cases of MRP, the same-subject thesis was relatively uncontroversial. When I (intellectually) think about one of my intellectual acts, then both the reflex and direct act belong to the same power, namely, my intellect, and so they have the same subject.[18]

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[17] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 35, ed. Jeschke, 697-698: "… distinctio actuum eiusdem potentiae non potest esse (a) ex subiecto … Ergo actus praedicti distinguuntur vel (b) ex obiecto, quia creantur ab alio et alio obiecto, (c) vel ex tempore, scilicet quia sunt in alio et alio tempore."

[18] However, the same-subject thesis with other cases of MRP was more controversial. Indeed, most medieval authors, accepting some form of Proclus's limitation on (mental) reflexivity, rejected the thesis at the sensory level. A sensory power, being a corporeal power, cannot reflect upon itself. Hence, sight cannot see its occurrent vision, etc. In such cases, the usual solution was to posit some higher-order (really distinct) sensory power, namely, the 'common sense', whose job it is to cognize the acts of the lower-order power. The common sense senses visions in the visive power, hearings in the auditory power, and so on. This is the solution that Pouilly (among others) pursues (Id., nn. 53-56, ed. Jeschke, 702-704). But some authors, e.g., Radulphus Brito, insisted upon the same-subject thesis even at the level of sensation. After all, a dog without an intellect can still reflect upon its acts of common sense. Hence, to avoid a regress of (corporeal) powers, we should admit that the common sense, at least, can reflect upon its own acts. But if the common sense can do this, then why not also suppose that Proclus's limitation is generally false, and so even the particular senses can reflect upon their own acts, e.g., sight upon its own visions, etc. Hence, for Brito the same-subject thesis is true for any case of MRP. (Brito does concede that such corporeal forms reflection are 'incomplete' compared to intellectual forms of reflection.) See Radulphus Brito, *Quaestiones super secundum librum Aristotelis De anima*, q. 42, Città del Vaticano, Biblioteca Apostolica Vaticana, Cod. Vat. lat. 3061, f. 20rb-vb.

The same-object thesis

By contrast, the same-object thesis was more controversial. Many authors, in fact, held that the direct act has as its object some external thing, e.g., a rose, whereas the reflex act has as its object some internal thing, namely, the direct act, and so they quite plainly have distinct objects.[19]

Pouilly offers a somewhat novel defense of the same-object thesis. A student of Godfrey of Fontaines, Pouilly appeals to a rather strong form of Godfrey's famous act-potency axiom: nothing can reduce itself from potency to act with respect to the same thing at the same time and in the same respect, neither on its own nor together with an accident that inheres in it.[20] But the direct act is an accident that inheres in the intellect. Further, the object of a mental act is, at least in ordinary cases, the cause of that mental act, that is, it reduces a mental power from potency to act. For instance, the rose reduces the intellect from potency (potentially thinking) to act (actually thinking). Hence, Pouilly reasons, were the direct act itself the *object* of the reflex act, and so the *cause* of the reflex act, it would reduce the intellect from potency (potentially reflexively thinking) to act (actually reflexively thinking). But then a patent violation of the strong form of the act-potency axiom would follow: the intellect would be reduced from potency to act thanks to an accident inhering in it (the direct act).[21] Hence, the object

[19] See, e.g., Guido Terreni, *Quodl*., I, q. 14, n. 10, ed. Friedman, 460; Radulphus Brito, *Quaestio* "Utrum actus rectus et reflexus sint unus actus", Vaticano, BAV, Cod. Vat. lat. 1086, f. 205vb; Prosper de Reggio Emilia, *In I Sent*., d. 1, q. 3, qla. 1, Vaticano, BAV, Cod. Vat. lat. 1086, f. 80ra, 80rb; Iohannes de Baconthorpe, *In I Sent.*, d. 1, q. 1, n. 47, ed. Jeschke, 608-609.

[20] Pouilly defends the act-potency axiom at length in *Quodl*., II, qq. 10-13 and *Quodl*., IV, q. 2, Paris, BNF, ms. lat. 15372, ff. 47ra-59ra and ff. 102vb-112va. On Godfrey's act-potency axiom, see A. Côté, "L'objet et la cause de la connaissance selon Godefroid de Fontaines", in *Freiburger Zeitschrift für Philosophie und Theologie* 54,3 (2007), 407-429 and the references therein. Pouilly's general theory of cognition follows Godfrey's theory quite closely. See, e.g., *Quodl*., V, q. 8 and *Quodl*. IV, q. 2, Paris, BNF, ms. lat. 15372, ff. 203ra-204rb and ff. 102vb-112va. Indeed, Pouilly repeats this argument in the case of the mental word in *Quodl*., IV, q. 2 and *Quodl*., V, q. 1, Paris, BNF, ms. lat. 15372, f. 111ra and f. 143va.

[21] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 35, ed. Jeschke, 698: "… [the direct act] is in the intellect as in a subject and it is an accident of it. But an accident cannot reduce its subject from potency to act, nor can it act upon it. However, the object reduc-

of the reflex act cannot be the direct act. But since there is no other suitable candidate for its object, it follows that the object of the reflex act is the same thing as the object of the direct act, namely, the rose.

The simultaneity thesis

Granted, then, that the subject is the same (the intellect) and the object the same (the rose), the only option remaining to distinguish direct and reflex acts would be to appeal to time. Perhaps the direct act occurs at time T1 and the reflex act at time T2. The simultaneity thesis – (4) in the above master argument – closes off this option: the direct act and the reflex act that concerns it, during a case of MRP, must occur at the same time.

The simultaneity thesis might seem trivially true: when I think that I think about the rose, clearly there is both a reflex and direct act. Pouilly defends it with an argument I will call *the reflexive truth argument*.[22] As Pouilly puts it, if, during a case of MRP, the reflex act and the direct act it concerns were not simultaneous, then

> every reflex act would be false, for when I think about a stone with a direct act and I reflect, I state that I am thinking about a stone. The reflex act would be false unless with or in it I am thinking about a stone. However, it is problematic that every reflex act be false. Hence, the reflex act is simultaneous with the direct act.[23]

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es the potency to act, *per se* and directly making an act in the power. Hence, the direct act is not the *per se* object of the reflex act."

[22] We can also find the reflexive truth argument in Guido Terreni, *Quodl*., I, q. 14, n. 9, ed. Friedman, 460; Petrus de Palude, *Quodl*., q. 6, Toulouse, BM, Cod. 744, f. 103va; Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, nn. 45-46, 49, ed. Jeschke, 608, 609-610 (discussed below); Prosper de Reggio Emilia, *In I Sent*., d. 1, q. 3, qla. 1, Vaticano, BAV, Cod. Vat. lat. 1086, f. 80ra-b; Radulphus Brito, *Quaestio* "Utrum actus rectus…", Città del Vaticano, BAV, Cod. Vat. lat. 1086, f. 205va.

[23] Iohannes de Polliaco *Quodl*., V, q. 7, n. 36, ed. Jeschke, 698 (translated text in italics): "Item non possunt distingui quia sint in intellectu in alio et alio tempore, immo sunt simul, quia *aliter omnis actus reflexus esset falsus, quia cum intelligo lapidem actu recto et reflector, dico me intelligere lapidem, quod esset falsum nisi cum sive in actu reflexo intelligam lapidem. Inconveniens autem est omnem actum reflexum esse falsum. Ergo est simul cum actu recto.*" See also Id., n. 37, ed. Jeschke, 698-699. Cf. Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, nn. 24-26, ed. Jeschke, 602 and 602-603.

In the minor premise Pouilly appeals to a kind of adequacy condition for any theory of MRP. Call it *the reflexive truth criterion*: reflex acts are never *always* false. Whatever theory we have about MRP should at the very least meet this criterion. Pouilly's reflexive truth argument, then, seems to be that were the direct act not simultaneous with the reflex act, either in itself as a distinct act or as identified somehow with the reflex act, then that reflex act would be false. But since the direct act cannot be a distinct simultaneous act (because of the same-subject thesis and the same-object thesis), it follows that these acts are one and the same act (somehow).

Pouilly's incidental-identity theory

Pouilly, then, rejects the view that, during a case of MRP, there are two acts (one direct and the other reflex). Quite the contrary, when one reflects upon the fact that one is thinking about a rose, there is just one act (call it R) just as there is just one act when one merely thinks about the rose without reflection (call this act D_{pure}, to indicate that it is a *pure* direct act). Now, clearly, R will be somewhat different from D_{pure}. First, its content will be different, for R is about not just the rose (as D_{pure} is), but also the further fact that the rose is now being thought about, that is, it is about the rose *as cognized*. Further, R is not just about the cognized rose but also about the fact that *I* am the one cognizing the rose. In other words, R will be a complex act with complex content, whereas D_{pure} is a simple act with simple content.

However, Pouilly maintains an even more radical thesis. He does not merely hold that during a case of MRP there is just one act and not two acts. Rather, he claims that this one complex act is somehow also *numerically identical with* D_{pure}, the simple act that immediately preceded it.[24] His motivation for this further claim seems to have been this. The reflexive truth criterion requires that sentences of the form 'I am thinking that I am thinking about a rose' are not true unless D_{pure} (which is what 'I am thinking about a rose' at least in part refers to) exists with R. My (pure and simple) direct thought about the rose must exist at the

[24] Even if the reflex act occurs *at the same time* as the pure direct act, in some situations, for instance, when I instantly reflect upon a direct act at the very moment I start to have that direct act, there is still a sense in which the pure direct act at least conceptually precedes the reflex act. See footnote 29 below.

same time as my reflex act in order for such sentences to be true. But since D_{pure} cannot exist as an act numerically distinct from R, it must be somehow numerically identical with R.

But how can something complex (R) be numerically identical with something simple (D_{pure})?[25] Further, the pure direct act can occur on its own – Pouilly does not think that reflexive consciousness is ubiquitous.[26] But how can two things be numerically identical if one can exist when the other does not?[27]

Pouilly's answer to such worries turns on his theory about the individuation of actions. Actions are what medieval authors called successive entities as opposed to permanent ones.[28] A permanent entity, such as Socrates, is such that it can exist all at once whereas a successive entity is such that it only exists over a continuous stretch of time. An action, as a successive entity, necessarily exists over a stretch of time.[29]

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[25] See here the objection that Palude puts to his own view in *Quodl*., q. 6, Toulouse, BM, Cod. 744, f. 102rb ([] = delenda; <> = addenda): "Illi actus non sunt unus numero quorum est unus simplex et respectu simplicis <obiecti> [apprehensionis(!)] et alius est necessario complexus et respectu <complexi> [complexionis(!)]. Sed actus rectus est simplex rei apprehensio et respectu simplicis obiecti, actus vero reflexus est necessario respectu complexi."

[26] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 51, ed. Jeschke, 702.

[27] As well, Pouilly thinks that the pure direct act is beatific whereas the reflex act that concerns it is not (Id., nn. 41, 51, and 57, ed. Jeschke, 699, 702, and 704). These, and other nearby objections, can also be found in Guido Terreni, *Quodl*., I, q. 14, nn. 5-9, ed. Jeschke, 458-460, who raises five such objections to Durand's version of the identity theory. (1) The direct act might be mere belief (*opinativus*) or uncertain (*incertus*) whereas the reflex act that concerns it knowledge (*scientificus*) or certain (*certus*); (2) the direct act might be false (*erroneus*) whereas the reflex act true (*verus*); (3) the direct act might exist whereas the reflex act does not; (4) the direct act might be understood whereas the reflex act not; (5) reflex acts might be multiplied *ad infinitum* whereas the direct act is not. These objections are reported (verbatim) by Baconthorpe in *In I Sent*., d. 1, q. 1, nn. 32-36, ed. Jeschke, 604-605, but applied as objections to *Pouilly*'s position. Baconthorpe also offers us potential replies on Pouilly's behalf (Id., n. 44, ed. Jeschke, 607).

[28] On the distinction between permanent and successive entities, see R. Pasnau, *Metaphysical Themes 1274–1671*, Oxford 2011, 374-395.

[29] This is something of an oversimplification. We can understand actions as coming in two basic sorts: diachronic actions (which occur over a temporal continuum) and synchronic actions (which are 'instantaneous', that is, they occur at a single moment in time). Baconthorpe, when presenting Pouilly's reflexive truth objection, explicitly allows that the direct and reflex acts might (at least sometimes) be taken to be one and the same synchronic action. See *In I Sent.*, d. 1, q. 1, n. 24, ed. Jeschke, 602: "… si

According to Pouilly, an action is the (numerically)[30] same action at any given time within this continuous stretch of time. When fire is burning a log for five minutes, it is the same action throughout the entire process, even though this process occurs over a continuous stretch of time. Hence, two actions can be distinct in time and yet still considered the same action provided there is no temporal gap between them. The fire's burning is the same action at two minutes that it was at one minute, and so on.

Moreover, or so Pouilly argues, the very same action at a later time might have a feature that it did not have at an earlier time. In such a case, the action at the later time can be said to be 'incidentally' identical with itself at an earlier time, and also 'incidentally' distinct from itself at an earlier time. Since Pouilly calls this 'incidental identity' (*identitas accidentalis*), I will call this *the incidental-identity theory of actions*.[31]

Pouilly puts forward two examples.

> If a hot thing on its own and directly is burning something and then one adds to that hot thing something which does not altogether block its burning, such as a fork or a point, it will cause the numerically same act as the one before, which is, however, incidentally distinct from itself [as it was before].[32]

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different in numero aut … in eodem subiecto causarentur in diverso tempore *aut saltem in diversis instantibus*." For example, if at the very first (temporal) instant in which I think about a rose I also reflect upon that thinking, then the acts, if they are one action, will be a synchronic action. (Of course, this is compatible with supposing that often they are a diachronic action.) Even so, such a synchronic action still 'unfolds' as it were within that single temporal instant, such that there is still a before and after in terms of non-temporal instants within that temporal instant. In what follows, I will talk of the direct act and the reflex act as if these were a diachronic action, but we need only replace 'continuous stretch of time' with 'continuous stretch of non-temporal instants within a given temporal instant' and 'at a given time' with 'at a given non-temporal instant within a given time' to account for cases where the action is synchronic.

[30] Again, I will assume that the distinction or sameness in question is numerical, as opposed to specific or generic, unless otherwise noted.

[31] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 52, ed. Jeschke, 702.

[32] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 52, ed. Jeschke, 702 (translated text in italics): "Et declaratur per simile quod obiectum acceptum cum actu intelligendi causet eumdem actum numero quem prius differentem accidentaliter. Sicut *si calefactum calefaciat aliquid secundum se et immediate, et illi calido addatur aliquid quod non omnino impediat calefactionem, sicut ancipita vel tela aliqua, creabit eumdem actum numero quem prius differentem accidentaliter a seipso*. Ita etiam obiec-

A hot rod will cause the same action (burning) over a continuous stretch of time even if we shape it into various shapes, provided, of course, the shape does not block its action. Likewise, my prayer before and after God has infused grace into me can be said to be the same prayer.

> The numerically same act incidentally can be natural and virtuous. For instance, if, while I am praying, grace is given to me: the numerically same act is natural and meritorious — the same, I mean, incidentally. And the natural act taken on its own is incidentally distinct from itself as meritorious.[33]

Pouilly goes on to apply this view of individuation to mental acts. Recall, first of all, that Pouilly follows Godfrey of Fontaines in maintaining a kind of passive view of the mind.[34] The object is the total and sufficient efficient cause of a mental act[35] and a mental act persists only so long as the object is acting upon the mind. Mental 'actions' like seeing, thinking, and so on, are, in fact, passions: whenever I am seeing something, the soul (or more precisely, its visive power) is passively being affected by the visible object. But what goes for actions also goes for passions, for a passion too is a successive entity. Hence, a passion is the same passion over a continuous stretch of time just as the action is, even if something is added to the agent or patient, provided what is added does not 'block' the action/passion.[36] The water's

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tum cum actu illo recto sive ut agens actum rectum in eadem potentia creat eumdem actum numero quem prius differentem accidentaliter et eumdem accidente, quod est idem."

[33] Iohannes de Polliaco, *Quodl*., V, q. 7, n. 52, ed. Jeschke, 702 (translated text in italics): "Et similiter *actus idem numero accidentaliter potest esse naturalis et virtuosus. Puta si dum oro detur mihi gratia. Idem actus numero est naturalis et meritorius. 'Idem' dico 'accidente'. Et differt actus naturalis acceptus secundum se accidentaliter a seipso ut est meritorius*. Et ideo idem agens cum aliquo addito causat eumdem actum quem prius numero identitate accidentali." Cf. Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, n. 42, ed. Jeschke, 607.

[34] See footnote 20 above.

[35] Or, in cases of intellectual cognition, the object together with the agent intellect.

[36] Pouilly (and Godfrey) also hold that there is also an *effect* over and above this passion, namely, a quality inhering in the soul, but this quality too persists only so long as the object is acting upon the soul and the soul is being acted upon by the object, that is, it persists only if there is the relevant action and passion. Now, even though this effect (the quality) is not itself a successive entity, we might still hold that its individuating conditions will be parasitic upon the individuating conditions of the passion and action involved in its continuous generation. Hence, mental acts are a peculiar sort of quality, a quality that is

being warmed up is the same passion at two minutes as it was at one minute, and so on. Hence, Pouilly argues as follows. Suppose I turn my head and look upon the rose on my table. The rose (the object) causes a certain effect in me (namely, act D_{pure}). If we 'add' to the rose certain non-essential features which do not block its action, and hold everything else equal (except the continuous passage of time), it will cause the (numerically) same effect in me, just as is the case when we shape the hot rod without blocking its burning action. The action will be the same action, and so too the passion and effect, even though the action (and so too the passion) has a non-essential feature now which it did not have before.[37]

Now, in the case of MRP, — if I then take a step back and reflect upon my initial thought about the rose — what is 'added' to the object

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wholly dependent upon the continuous activity of its agent, much like, on some views, the light in the air is a quality that continuously depends upon the Sun's action of illumination. See Godefridus de Fontibus, *Quodlibeta*, IX, q. 19, ed. J. Hoffmans (Les Philosophes Belges 4), Louvain 1928, and Iohannes de Polliaco, *Quodl*. IV, q. 2, Paris, BNF, ms. lat. 15372, ff. 102vb–112va. For discussion of Godfrey's view, see P. J. Hartman, "Causation and Cognition: Durand of St.-Pourçain and Godfrey of Fontaines on the Cause of a Cognitive Act", in *Durand of Saint-Pourçain and His Sentences Commentary: Historical, Philosophical, and Theological Issues*, ed. A. Speer et al., Leuven 2014, 229-256.

[37] Iohannes de Polliaco, *Quodl*., V, q. 7, nn. 48-51, ed. Jeschke, 701-702 ([] = delenda; <> = addenda): "Et isto tertio modo videntur esse unus actus vel idem actus rectus et reflexus, quia cum actus sortiatur speciem ex obiecto, idem videtur iudicium de obiecto et de actu. Et ideo qualem unitatem inveniemus in obiecto actus recti et reflexi, consimilem debemus ponere in actibus. Sed obiectum actus recti se habet ad seipsum ut est obiectum actus reflexi, sicut se habet subiectum sumptum secundum se ad seipsum sumptum cum accidente, ut Sortes ad Sortem album, quia obiectum secundum se acceptum movet per se directe et sine medio vel sine quocumque ad actum rectum ut rectus est, ut cum intelligo Deum aut lapidem. Item illud idem obiectum una cum illo actu recto sive ut agens illum potest movere eumdem intellectum. Et quia obiectum ut sic est idem numero et non diversum cum seipso secundum se accepto, et intellectus similiter est unus et idem numero, non potest nunc creare alium actum numero quam prius. Et ideo creat eumdem numero. Sed quia obiectum secundum se acceptum est idem numero accidentaliter cum seipso intellecto sive cum seipso sumpto cum actu intelligendi, sicut Sortes cum Sorte albo, ideo creat actum quem prius eumdem accidente. Et sic actus rectus et reflexus sunt idem accidente sive accidentaliter, ut Sortes cum seipso albo. Et per consequens et actus ut rectus differt accidentaliter a seipso ut reflexus est. Et quia subiectum potest esse sine suo accidente, ut Sortes sine <albedine> [albo] sive absque quo Sortes sit albus, ideo et potest esse actus absque quo sit reflexus." Cf. Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, n. 41, ed. Jeschke, 606-607.

is not a shape but rather it is this: its being cognized.[38] Since this added feature (its being cognized) does not 'block' its action upon me, the effect it (continues to) bring about (namely, act R) can be said to be (incidentally) numerically the same as the effect it brought about in me before on its own (namely, D_{pure}). Hence, Pouilly can maintain that the reflex act at time T2 and the pure direct act at time T1 are the same act, even though the former is complex with complex content and the latter simple with simple content. Likewise, they are the same act even though D_{pure} can exist when R does not exist.

John Baconthorpe's non-simultaneous distinction theory

John Baconthorpe rejects Pouilly's identity theory. However, he does not, then, pop for something like Guy's simultaneous distinction theory, according to which the direct and reflex acts are two (numerically) distinct acts that occur at the same time. He rejects Guy's view on the grounds that a given mental power can have or elicit only one mental act at a given time.[39] Instead, Baconthorpe champions a view I call *the non-simultaneous distinction theory*.[40]

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[38] Pouilly will variously characterize the object in such a case as the 'cognized' object, the object 'with the direct act', or the object 'as bringing about the direct act'. See, e.g., Iohannes de Polliaco, *Quodl*., V, q. 7, n. 52, ed. Jeschke, 702: "… obiectum acceptum cum actu intelligendi… [O]biectum cum actu illo recto sive ut agens actum rectum…" Id., n. 50, ed. Jeschke, 701-702: "… obiectum una cum illo actu recto sive ut agens illum… [O]biectum … cum seipso intellecto sive cum seipso sumpto cum actu intelligendi…"

[39] On this principle, see footnote 7 above.

[40] He appears to have drawn his view from Radulphus Brito, who also defends it. Unfortunately, the sole textual witness we have of Brito's discussion is contained in an *abbreviatio* in Prosper's Notebook (*Quaestio* "Utrum actus rectus…", Vaticano, BAV, Cod. Vat. lat. 1086, ff. 205va–206rb). It is included among a set of quaestiones on ff. 195r–208r which likely all belong to Brito: 'Rad.' is written in the top middle margin of these folios, elsewhere on f. 80ra Prosper quotes verbatim from this *abbreviatio* and in the left margin of that folio he attributes the quote to 'M. Radulphus Brito'. On the attribution, see W. Courtenay, "Radulphus Brito, Master of Arts and Theology", in *Cahiers de l'Institut du Moyen-Âge grec et latin* 76 (2005), 149, fns. 54–55 and Friedman, "On the Trail" 449, fn. 42. Courtenay tells us that he does not know which of Brito's works this *abbreviatio* is an *abbreviatio* of, although it might belong to Brito's *Quodlibet*, as is the case with certain other *abbreviationes* included in this section of Prosper's Notebook. If it is a quodlibetal question, then that establishes a *terminus a quo* of 1314, when Radulphus incepted as master. In any case, the *abbreviatio* itself re-

Baconthorpe rejects the simultaneity thesis (i.e., [4] in Pouilly's master argument). He thinks that during a case of mental reflection properly so-called the direct act and the reflex act that concern it need not be *really* simultaneous. On his view, during a case of MRP, the reflex act really exists but the direct act does not really exist. However, he admits that the direct act must *somehow* exist at the same time as the reflex act. The sense in which it *somehow* exists is the sense in which a thing that does not now really exist can be said to exist by way of a representation of that thing. For instance, a rose that does not now really exist can be said to exist by way of a representation of that rose. So too a direct act that does not now really exist can be said to exist by way of a representation of it. Hence, the direct act exists with the reflex act in the sense that Caesar coexists with my vision of the painting representing Caesar. Baconthorpe calls such existence 'objective [*obiectivum*]' existence.[41]

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ports verbatim Thomas Wylton's position in *Quaestio* "Quod in intellectu possunt esse plures intellectiones simul", ed. Stella, "Le Quaestiones", 507-517, and so it must be posterior to it and Durand's *QQ. de lib. arb*., q. 3 (which is what Wylton is responding to), that is, after 1312. The view is also discussed in Petrus de Palude, *Quodl*., q. 6, which, according to Joseph Koch, was delivered in December, 1314 and available in written form during the first half of 1315. On the dates for Palude's *Quodlibet*, see R. Friedman, "Dominican Quodlibetal Literature, ca. 1260-1330", in *Theological Quodlibeta in the Middle Ages. The Fourteenth Century*, ed. C. Schabel, Leiden 2007, 453. Assuming Palude is discussing Brito's view, this establishes a *terminus ante quem* of December, 1314. Hence, Easter, 1314 seems to be a reasonable hypothesis for its date. However, the same sort of view is considered in Iohannes de Polliaco, *Quodl*., V, q. 7, nn. 37-41, ed. Jeschke, 689-699 (1312). It is also (albeit briefly) considered in Durandus de Sancto Porciano, *QQ. de lib. arb*., q. 3, ed. Stella, 497.21-24 (1312), and even more briefly by Guy Terrena in an *abbreviatio* of *Quodl*., I, q. 14, contained elsewhere in Vaticano, BAV, Cod. Vat. lat. 1086 on f. 263va-b (1313). Brito had a long career at Paris – he was an arts master from 1300 until 1307 – so perhaps the view these earlier authors discussed was also his, from an earlier text. I have consulted his *De anima* and *Sentences* commentary, and no such view is put forward there. (Courtenay also could find no discussion of reflex acts in Brito's *Sentences*.)

[41] Iohannes de Baconthorpe, *I Sent*., d. 1, q. 1, n. 49, ed. Jeschke, 609-610: "… cum dico, 'Intelligo me intelligere lapidem', sensus [est] … quod intellectione reflexiva intelligam ipsum actum rectum quasi … simul in esse obiectivo… Licet enim transeat actus rectus adveniente actu reflexo quantum ad existentiam realem, tamen obiective remanet in memoria et repraesentatur ibi… Cum enim dico, 'Intelligo me intelligere lapidem', haec est vera quia intelligere lapidem est in rerum natura in esse obiectivo in memoria licet non in sua reali existentia." Cf. Radulphus Brito, *Quaestio* "Utrum actus rectus…", Città del Vaticano, BAV, Cod. Vat. lat. 1086, f. 205vb: "Ideo non oportet

However, the mere 'objective' existence of the direct act is insufficient, for when I remember a past act, the past act also has mere 'objective' existence.[42] Hence, Baconthorpe goes on to argue that, during a case of MRP, the direct act is not merely represented but represented *as though it were a really present and existing act*.[43] It is in this (what we

quod sint simul ut actus nec actu, quia aliquid potest esse obiectum dato quod non sit… Dicendum quod sufficit quod sit habitualiter et in ratione obiecti." *Ibidem*, f. 206ra: "… sunt simul unum obiective. Ideo non oportet quod sit actu sed sufficit quod sit in aliquo repraesentativo… Et cum dicas quod falsum diceres dicendo, 'Intelligo me intelligere', dicendum quod sicut verum est dicendo, 'Intelligo rosam', dato quod non sit, ita hic." Petrus de Palude, *Quodl*., q. 6, Toulouse, BM, Cod. 744, f. 102va (presenting Brito's view; * = *lectio incerta*): "Respondent quod si dicatur quod sunt simul sed unus ut actus et alius ut obiectum, concedunt quod sint simul, sed non utrumque ut actus. Quia si primo fit actus intelligendi lapidem et postea aliquis intelligit se lapidem intelligere, sufficit ad hoc quod haec* [scilicet: 'Intelligo me intelligere lapidem'] sit vera quod prima intellectio tunc sit ibi in habitu et non in actu, quia solum requiritur quod sit in ratione obiecti. Sicut quando intelligo lapidem, lapis est in ratione obiecti, contingit etiam quando intelligo me intelligere lapidem, intellectio lapidis est in ratione obiecti. Sed ad hoc quod aliquid sit in ratione obiecti respectu intellectus non oportet quod sit praesens secundum suam actualitatem." Id., f. 103va: "… actus rectus et reflexus numquam sunt simul actu, quia ad hoc quod talis actus intelligendi sit intelligibilis in ratione obiecti non oportet quod sit praesens in sua existentia in actu intellectus, sed sufficit quod sit ibi habitualiter vel quod aliquando fuerit ibi, quia ad hoc quod aliquid moveat intellectum in ratione obiecti non requiritur quod sit praesens in sua existentia, quia intelligo rosam non entem quia remanet in phantasia adeo repraesentativum rosae. Sic etiam sufficit quod aliqualiter in habitu sit intellectio ista in intellectu ad hoc quod sit intelligibilis. Vel forte per apparens quod repraesentabat rem cuius erat intellectio poterit intellectus moveri ad cognoscendum illam intellectionem ut est quoddam intelligibile respectivum ad aliquod obiectum cuius est vel etiam ut est quaedam res absoluta in se de genere qualitatis. Et sic non erunt simul plures actus intelligendi inquantum sunt actus intelligendi." See also the presentation of the view found in Pouilly, Durand, and Guy, discussed above in footnote 40.

[42] See Iohannes de Polliaco, *Quodl*., V, q. 7, n. 37, ed. Jeschke, 699-700.

[43] Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, n. 49, ed. Jeschke, 609: "Licet enim transeat actus rectus adveniente actu reflexo quantum ad existentiam realem, tamen obiective remanet in memoria et repraesentatur ibi quantum ad omnem rationem eius ut est actus intelligendi lapidem *et quantum ad rationem actus secundum quod actus dicitur elicitus*… ut non sit sensus, 'Intelligo me intelligere lapidem', quia intellexi lapidem in praeterito, sed in praesenti." Cf. Petrus de Palude, *Quodl*., q. 6, Toulouse, BN, Cod. 744, f. 102va: "Unde tunc ista erit vera, 'Intelligo me intelligere lapidem,' quia intelligo intellectionem lapidis esse in me in ratione obiecti moventis ad talem intellectionem."

would call) *subjective*[44] sense, then, that the direct act is 'simultaneous' with the reflex act.[45]

Baconthorpe thinks that his theory has advantages over Pouilly's identity theory. While he adduces a number of objections to the view, his chief objection is that Pouilly fails (ironically) to preserve the reflexive truth criterion he set out for himself. Recall that, according to the reflexive truth criterion, it is absurd to suppose that *all* our reflex acts are false. According to Pouilly, we can safeguard the idea that a reflex act is true only if we suppose that the direct act it concerns coexists with the reflex act, either as (incidentally) identical with it (as he holds) or as a distinct simultaneous act (as Guy holds). But since Guy's view violates the principle that a given mental power can have only one act at a given time, the better view, Pouilly reasons, is his own incidental-identity theory. However, Baconthorpe argues, Pouilly's incidental-identity theory fails to meet the reflexive truth criterion, because incidental identity is not a strong enough form of identity to provide us with the existence of the direct act which Pouilly needs. Here's why.

Consider the earlier examples of the hot rod's burning and my prayer. According to Pouilly, we can claim that action A and action B are the (incidentally) same action over a continuous stretch of time. Hence, my prayer that occurs at time T1 is numerically the same prayer that occurs at time T2, even though at time T2 I acquire a non-essential feature that I did not have at T1, namely, grace, since grace does not 'block' the action, and so my prayer at T2 is supernatural or meritorious whereas at T1 it was natural.

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[44] For medieval scholastics, to say that something has subjective existence (*esse subiectivum*) is to say that it has real and (what we would call) objective existence, whereas to say that something has (mere) objective existence (*esse obiectivum*) is to say that it has existence (merely) as an object of thought, that is, what we would nowadays call subjective existence. See G. Pini, "Duns Scotus on What Is in the Mind", in *Recherches de Théologie et Philosophie médiévales* 87,2 (2020), 321-323 and M. Klein, "Mental Gaze and Presence", in *Recherches de Théologie et Philosophie médiévales* 87,2 (2020), 371-392.

[45] Baconthorpe's view, then, comes close to contemporary higher-order theories that hold there is no need for a 'real immediacy' of the direct (lower-order) act to the reflex (higher-order) act, but instead a mere 'subjective immediacy' suffices. See D. Rosenthal, "Varieties of Higher-Order Theory", 33.

However, as Baconthorpe points out, even if we accept this much, we still will not have the claim that Pouilly wants. This is because the (temporal) parts of a successive entity do not coexist with each other. Even though it is the same day during the evening that it was during the morning, the earlier part of a day does not exist with the later part of the day. So too we would say that the earlier part of an action does not coexist with the later part of that action even if it is the same action. To continue our example: the *natural* prayer at T1 *does not exist* when the *supernatural* prayer at T2 *exists*. We can claim that these are (incidentally) one and the same prayer, since there is no temporal gap, but there is still a crucial sense in which the natural prayer (the earlier part) *does not exist* when the supernatural prayer (the later part) exists.[46]

Applied to the case at hand, even if the direct act D_{pure} at time T1 precedes the reflex act R at time T2 such that there is no intervening temporal gap and nothing added that would block the action of the object upon the mind – and so we can claim that they are the same action/passion – we still have to admit that at time T2 D_{pure} does not exist when R exists. But in order for the reflexive truth criterion to be met, it is not enough that D_{pure} merely come before R with no temporal gap between the two. Mere incidental identity is insufficient. In order for a reflexive statement such as "I am thinking that I am thinking about the stone" to be true, it must be the case that D_{pure} coexists with R.[47]

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[46] Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, n. 45, ed. Jeschke, 608: "… quando actus duo sunt idem per accidens, tunc primus non permanet cum secundo, sed solum succedit sibi, et sunt solum unus per accidens per hoc quod unus continuatur cum alio sine interpolatione temporis. Verbi gratia, in exemplo eorum, quando operatio quae primo fuit naturalis fit supernaturalis per hoc quod in medio suae durationis infundebatur gratia, planum est quod operatio supernaturalis succedit naturali, naturalis tunc noviter cessat, et ita solum dicuntur unus per accidens propter continuationem in invicem."

[47] Iohannes de Baconthorpe, *In I Sent*., d. 1, q. 1, n. 45, ed. Jeschke, 608: "Sed in proposito oporteret quod actus rectus permaneret simul cum reflexo et non solum quod continuetur sibi per continuationem sine interpolatione. Aliter enim omnis actus reflexus esset falsus dicens intelligo me intelligere." Note that this will be true even if D_{pure} and R occur at the same time, that is, even if we accept that we are dealing with a synchronic action (see footnote 29 above). Within a given moment in time we can still claim that there are two non-temporal instants, I1 and I2, such that D_{pure} exists at time T1 but instant I1 whereas it does not exist at time T1 instant I2, which is 'when' R exists. So we will never have a non-temporal instant within a temporal instant wherein both D_{pure} and R coexist.

How, then, does Baconthorpe think that his view meets the reflexive truth criterion? After all, he fully admits that the reflex act and the direct act don't really coexist, since the direct act, on his view, does not really exist at all during a case of MRP. On Baconthorpe's view, we can safeguard the idea that a reflex act is true not because the direct act really coexists with it, but because the direct act *subjectively* coexists with it, that is, because it is suitably represented, namely, represented as though it were present.[48] While Baconthorpe isn't very explicit here, the idea seems to be that as long as the *content* of a reflex act is such as the sentence reports, then that sentence (and by extension the reflex act) will be true. As long as I represent a direct act as being present, the sentence "I am thinking about a present direct act" will be true, and so too by extension the sentence "I am thinking that I am (now) thinking about a rose."

To be sure, there are mysteries here. If I can represent something that does not really exist as present (as really existing) in the case of MRP such that the sentence "I am thinking about a present, really existing direct act" is true even though a direct act does not really exist, then why not suppose this generalizes to other cases? For instance, I might represent a rose that does not exist as though it were present and so make the sentence "A rose exists" true. But if this generalizes to other cases, then it would seem that the truth of an act (or the corresponding sentence) will not depend upon what is the case, but upon what seems to me to be the case. Perhaps there is a way to avoid the generalization, although Baconthorpe does not offer us any suggestions here. But such a commitment is the cost we must pay if we wish to square reflexive state consciousness with, on the one hand, the dogma that two mental acts cannot exist in the mind at the same time, together with the failure of Pouilly's incidental-identity theory, on the other.

Conclusion

Let's take stock. According to Pouilly, during a case of mental reflection properly so called, the direct act and the reflex act that concerns it are numerically identical, albeit in the qualified sense in which the earlier and later parts of a single action are numerically identical. However, as Baconthorpe points out, such a view fails to satisfy the reflex-

[48] See the texts quoted in footnote 43 above.

ive truth criterion. In order for the sentence "I am thinking that I am thinking about a rose" to be true, the direct act that the phrase "I am thinking about a rose" picks out must exist at the same time as the reflex act. Yet, on Pouilly's view the direct act cannot really exist at the same time as the reflex act any more than the earlier and later parts of a day can really coexist with each other. For Baconthorpe, the direct and reflex acts must both coexist, but they need not really coexist. Instead, the direct act merely needs to exist as a represented object provided it is represented *as present*, that is, it merely needs to seem to be present, even though it is not in fact present.

Loyola University Chicago

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The diagram of *minima naturalia* in Marcos Jorge's Commentary on Aristotle's *Physics* (*Physica*, I, 4)

Paula Oliveira e Silva – João Rebalde

1.Intellectual context of Marcos Jorge's Commentary on Aristotle's *Physics* (Coimbra, 1558-1559)

The intense educational activity of Jesuit schools, and specially philosophy teaching, has been the object of numerous studies. There is consensus among scholars that the Jesuits' educational activity deeply marked the period between the foundation of the Society and its extinction. This activity is a relevant part of the Jesuits' intellectual history of that period, not only in Europe but also in the New World and in East Asia.

However, the existing literature is often either focused on specific areas, or directed toward specific geographic regions or subjects.[1] This is certainly inherent to all research, since it should focus on a particular object. When it comes to mapping the intellectual history of a given period, unexplored areas will inevitably remain, either because there have not been enough studies on them yet or because existing works have generated new fields of research.

Such is the case of the period from the 16th to the 18th century, rich in events relevant to human history and, regarding the topic here analysed, to the history of philosophy and of sciences, in which comprehensive knowledge will always be lacking.

In the case of Edwards' stimulating study, he proposes to contribute to the knowledge of the Counter-Reformation period, which is also our interest here, by means of an analysis that leaves aside established

[1] See e. g. M. Edwards, "Intellectual Culture", in *The Ashgate Research Companion to the Counter-Reformation*, ed. A. Bamji, G.H. Janssen and M. Laven, Farnham 2013, 304-305.

Per cognitionem visualem. The Visualization of Cognitive and Natural Processes in the Middle Ages
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presuppositions, looking at the same realities from less familiar perspectives and themes. The present research based on the subsistent intellectual heritage of philosophy teaching in Coimbra and Évora along the 16th century[2] allows us to corroborate Edwards' heuristic perspective. Focused on the study of less known sources, our research has enabled us to complete information about the intellectual milieu of Coimbra and Évora in the second half of the 16th century and to approach such sources under innovative perspectives. While doing so, we directed our attention to the processes of continuity and erosion suffered by the Aristotelian doctrines taught in this period in the Portuguese context.[3] In this article, we analyze the commentary on Book I, Chapter 4, of Aristotle's *Physics* by the Portuguese Jesuit Marcos Jorge (1524-1571), from whom remains an almost complete philosophical course consisting of commentaries on Aristotle's works. Preserved in manuscript form in the Royal Library of the El Escorial Monastery,[4] this course consists in the complete course of philosophy taught by Marcos Jorge between 1556 and 1560 in Coimbra's College of Arts. Marcos Jorge is mainly known to historiography for having been the author of one of the most famous Christian doctrine catechisms written in the 16th century,[5] but his five voluminous commentaries on Aristotle's work remain virtually unknown.

Among the subjects that make up Marcos Jorge's course is a complete commentary on Aristotle's *Physics*,[6] which occupies the entire

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[2] P. Oliveira e Silva and J. Rebalde, "Concerning doctrinal divergences on the nature of the human composite in two commentaries on Aristotle's *De anima* (Anonymous, cod. 2399 BGUC) and F. Suárez. New elements on the Jesuit School of Coimbra and the Cursus Conimbricensis", in *Francisco Suárez (1548-1617). Jesuits and the Complexities of Modernity*, ed. R. A. Maryks and J. A. Senent de Frutos (Jesuit Studies 22), Leiden-Boston 2019, 378-410; P. Grendler, "Philosophy in Jesuits Schools and Universities", in *Jesuit Philosophy on the Eve of Modernity*, ed. C. Casalini (Jesuit Studies 20), Leiden-Boston 2019, 16.

[3] On this subject see Ch. Sander, "Uniformitas et soliditas doctrinae: History, Topics, and Impact of Jesuit Censorship in Philosophy (1550–99)", in *Jesuit Philosophy on the Eve of Modernity*, ed. C. Casalini (Jesuit Studies 20), Leiden-Boston 2019, 55-53.

[4] El Escorial, Real Biblioteca del Monasterio de El Escorial, J III 1/5. See F. Stegmüller, *Filosofia e teologia nas universidades de Coimbra e Évora no século XVI*, Coimbra 1959, 87.

[5] Marcos Jorge, *Doutrina cristã escrita em diálogo para ensinar os meninos* (Lisboa 1566). See: *Doutrina cristã escrita em diálogo para ensinar os meninos*, ed. J. M. Pinto dos Santos, Lisboa 2016.

[6] Patrimonio Nacional. Real Biblioteca del Monasterio de El Escorial, J III 3.

third volume,[7] with 343 folios, prepared between August 1st, 1558 and July 12th, 1559. Given the structure of the study cycles, spread over four years, the commentary would have been the basis for the classes between the second half of the second year of the course and the first half of the third year. These courses followed the Parisian commentary framework, introduced by the Jesuits to teach philosophy in their colleges. The existence of this complete course on philosophy teaching by Marcos Jorge is relevant in several ways. It contributes to a more accurate study of the history of the reception of Aristotelianism in the Western world, from its Latin Medieval transmission to the beginning of Modernity and the many transformations it went through in the course of the years. Specifically, it brings light to the intellectual milieu of Coimbra of the time and to the Aristotelian interpretation taught in Portugal by the so-called first-generation Jesuits, which included well-known names such as that of Pedro da Fonseca. Fonseca and Marcos Jorge were fellow countrymen and entered the Society of Jesus roughly in the same period. Initially, they were both elected by Jerónimo Nadal to promote the project of the famous *Cursus Conimbricensis*.[8]

Marcos Jorge's course is also relevant because it is one of the few remaining complete philosophy courses from this period in Portugal, which long precedes the *Cursus Conimbricensis*' publication.[9] Finally, and as we have been attesting, Marcos Jorge's philosophy course is im-

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[7] In the *incipit* of *Physics*, it can be read: "Annotationes in octo physicorum Aristotelis libros. Calendis Augusti et anno 1558." In the last folio of the volume (fol. 343r) it reads: "Finitus fuit hic, simulque omnes 8 Physicorum Aristotelis libri die Julii 12º, annoque 1559."

[8] See J.P. Gomes, *Os Conimbricenses* (Biblioteca Breve. Série Pensamento e Ciência), Lisboa 1992, 36-43.

[9] Regarding this Coimbra philosophy course, see C. Casalini, *Aristotle in Coimbra. The* Cursus Conimbricensis *and the Education at the College of Arts*, trans. L. Salvarani, Abingdon-New York 2017; M. Santiago de Carvalho, *O curso aristotélico jesuíta conimbricense*, Coimbra 2018; M. Santiago de Carvalho and M. Camps, *Cor, Natureza e Conhecimento no Curso Aristotélico Jesuíta Conimbricense (1592-1606)*, Coimbra 2016; M. Santiago de Carvalho, "Ensinar Filosofia na Coimbra do Século XVI: o caso dos 'Commentarii Collegii Conimbricensis S.I.' (1592-1606)", in *Noctua. International on-line Journal on the History of Philosophy* (2015), 182-203. See also the monumental online encyclopedia dedicated Coimbra in this matter: M. Santiago de Carvalho (dir.) and S. Guidi (ed.), *The Conimbricenses.org Project. A digital platform for the History of Philosophy and Theology in Coimbra (1542-1772)*: http://www.conimbricenses.org/

portant because, dating from a much earlier period than the establishment of the *Ratio Studiorum*, it reflects the intellectual work of these first-generation Jesuits, which was carried out rather freely – although in conformity with their supervisors' philosophy teaching guidelines, concerning the perspectives adopted on issues with theological implications of greater or lesser relevance. In fact, in the studies we have published about these first-generation Jesuit teachers in Coimbra we have highlighted this aspect in particular, which contrasts with the perspective defended by some scholars who emphasize the subservience of the Jesuit philosophy teaching to ecclesiastical rules.[10] However, as we shall see below, Marcos Jorge is fully aligned with the Aristotelian commentary tradition as far as the issue under analysis is concerned, hence leaving no room for looser interpretations.

In this study, we present two diagrams by Marcos Jorge, which illustrate his explanation of *Physics* I, 4. Given the extent and complexity of the theoretical problems reflected in them, we shall only focus on one of these diagrams. The diagram in Figure 1 approaches the issue of the cognoscibility of the infinite, which we will not analyze here,[11]

[10] In our studies, mainly those based on manuscript sources containing courses taught during the second half of the 16th century in Portuguese universities, we observe the existence of a relative freedom of teaching, which is reflected for example in an interpretation of philosophical questions not always in line with that of Thomas Aquinas and the Thomistic School, as well as in the discussion of probable positions, and an advancement of the teacher's personal position. See, for example, Oliveira e Silva e Rebalde, "Concerning doctrinal divergences on the nature of the human composite", 378. P. Oliveira e Silva, "Two Sixteenth-Century Coimbra Commentaries on *De anima*: Petrus Fonsecae (attr.) and Christophorus Gilli. On the Soul and On the Immortality of the Soul" (*Revista Española de Filosofía Medieval*: forthcoming). Positions defending that, especially during the second half of the 16th century, philosophy was exercised quite freely: M. Heyller, *Catholic Physics. Jesuit Natural Philosophy in Early Modern Germany*, Notre Dame IN. 2005,13-30. In the same line of interpretation, Grendler, "Philosophy in Jesuits Schools and Universities", 13-33. See Sander, "Uniformitas et soliditas doctrinae", 53-55. For contrasting positions emphasizing that Jesuit philosophy teaching was under the Catholic Church control at the time, see for example, A. Blair, "Science and Religion", in *The Cambridge History of Christianity. Vol. VI: Reform and Expansion 1500-1600*, ed. R.P. Hsia, Cambridge 2007, 425-442; V. Navarro, "Tradition and Scientific Change in Early Modern Spain: The Role of the Jesuits", in *Jesuit Science and the Republic of Letters*, ed. M. Feingold, Cambridge-London 2003, 331-387.

[11] The study of this philosophical question converges with the question of divine knowledge of natural bodies and whether God alters their course or interferes in the

while that of Figure 2 focuses on the limits of natural bodies. This study focuses on the latter.[12] Clearly, both diagrams were designed for pedagogical purposes, with the aim of establishing a conceptual map that would act as a guide to easily identify the main doctrines taught by Marcos Jorge while answering the two questions addressed in his commentary on Aristotle's *Physics* I, 4: *An infinitum sit cognoscibile* and *An entia naturalia terminentur ad maximum et minimum* [51v].

The two questions discussed here by Marcos Jorge have as their background the positions explained by Aristotle in Book I, 4 of *Physics* and the long tradition of commentary that follows it. In this text, Aristotle contrasts his position on the principles that make up natural bodies with that of other ancient philosophers whom he designates as *physicists*. In particular, Aristotle criticizes the positions of Anaximander, Anaxagoras and Empedocles for considering that the origin of the *naturalia* is a principle which contains opposites in itself.[13] According to this opinion, natural entities would originate from this principle through

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cosmic order. The study of this philosophical question is one of the goals of the project entitled *Does God Know the Contingents? The Origin in the 16th Century of the Middle Knowledge Doctrine* (J. Rebalde, P. Oliveira e Silva: EXPL/FER-FIL/1410/2021) which aims to identify the background of the middle knowledge doctrine precisely in the intellectual milieu of Coimbra and Évora. The study of Marcos Jorge's explanation in his *Physics* course is therefore in progress as part of the research carried out in this project.

[12] In Marcos Jorge's philosophical course, especially the commentaries on Aristotle's logical works, diagrams appear to be similar to many others present in philosophical courses of the time. See, for example, Marcus Georgius, *De oppositis*, c. 1, ff. 128r-128v; *De Perihermeneias*, lib. I, fol. 179v e lib. II, fol. 216r (El Escorial, Real Biblioteca del Monasterio de El Escorial, J III 1). In teaching Aristotle's works on logic, these diagrams were mainly used to clarify the Aristotelian theories of inference through visual representations. However, among the commentaries arising from philosophy teaching in Portugal in the 16th century it is less frequent to find diagrams to explain Aristotle's *Physics*. For example, these schemes do not appear either in Pedro Luís' commentary on *Physics* (see Petrus Ludovicus, *Annotationes in libros Physicorum*, 1566, lib. I, c. 4, ff. 33v-42v: MS. Lisboa, Biblioteca Nacional de Portugal, 2535) or in the *Coimbra Commentary to Physics* (see *Commentarii Collegii Conimbricensis Societatis Iesu. In octo libros Physicorum Aristotelis Stagiritae*, Conimbricae 1592, lib. I, c. 4, 106-126).

[13] Aristoteles, *Physica*, I, c. 4, 187a20-187a31. For Aristotle's *Physics* we use Jonathan Barnes' translation and indicate the references according to Immanuel Bekker's edition: Aristotle, *The Complete Works of Aristotle. The Revised Oxford Translation*, vol. 1, trans. J. Barnes (Bollingen Series 71:2), Princeton 1995, 7-8.

a process of extraction. By exposing how the ancient physicists thought out this process, Aristotle particularly criticizes Anaxagoras' position for stating that "everything is in everything."[14]

Aristotle explains that, according to Anaxagoras, the uniform parts, combined in this primary principle, are infinite[15] and the Intellect extracts them from this mixture. Thus, in each natural entity extracted from this mixture subsists the nature of the principle, that is, the combination of uniform parts. From Anaxagoras' view and according to Aristotle's description, the nature of each thing, its formal identity, depends on the greater or lesser quantity of uniform parts present in the compound. For example, corn would result from a larger assemblage of cereal parts of the corn species, which would overlap species between them to form the nature of corn. Starting from the principle that "nothing comes from nothing," also endorsed by Aristotle, and considering that everything is extracted from the opposites, Anaxagoras assumed that greater or lesser quantity of the contrary principle would give rise to the emergence of each nature from this original multiple, by means of extraction.[16]

Aristotle's critique of Anaxagoras is structured in five arguments, set out throughout *Physics* I, 4.[17] The first is against Anaxagoras' conception of the infinite nature of the primary principle. The other four focus on how Anaxagoras conceives the origin and composition of natural bodies from this principle.

In his commentary on *Physics*, I, 4, Marcos Jorge makes use of the scholastic methodology of text commentaries followed by questions. Thus, in the first part of his exposition, the Jesuit follows Aristotle's text quite literally and shows its content. He then formulates two questions whose doctrine he is interested in explaining, which actually summarize the main problems discussed in the commentary tradition when commenting on Aristotle's *Physics* I, 4. Finally, he presents his position and discusses it. In this discussion, he adopts the model of *disputatio*. He begins by presenting the problem at issue and by taking a position within the doctrinal discussion. He then lists arguments in favor of his

[14] Aristoteles, *Physica,* I, c. 4, 187a31, trans.Barnes, 8.

[15] Aristoteles, *Physica,* I, c. 4, 187a24, trans.Barnes, 7.

[16] Aristoteles, *Physica,* I, c. 4, 187a29-187a30, trans. Barnes, 8.

[17] Aristoteles, *Physica*, I, c. 4, 187a26-187a29, trans. Barnes, 7-8.

viewpoint, whilst indicating probable opinions (*opiniones probabiles*) and discussing alternative solutions. Finally, he lists objections to his position and resolves them.

2. The question about the limits of natural bodies in Marcos Jorge's Commentary (*Phys*. I, 4).

The diagram in Figure 2, whose content we analyze here, displays a table of oppositions or alternatives regarding maximum and minimum terms that can occur in natural entities. Marcos Jorge notes that the question of whether there is a maximum and a minimum term for natural entities comes from the analysis of Aristotle's second argument in *Physics* I, 4, against Anaxagoras. It is a question of knowing "whether natural things have an exact limit as regards greatness or smallness," or whether it is rationally tenable to admit that matter is infinitely extensive.[18]

This question formulated by Marcos Jorge is known in literature as the debate on the *minima naturalia* and its path can be mapped early in the history of the commentary tradition on Aristotle's *Physics*. The most comprehensive studies on this matter in the commentary tradition belong to John Murdoch, whose 2001 essay provided two especially relevant details to this research.[19] One of them is the list he provides of the commentaries in which, from the Middle Ages to the 16th century, this issue was discussed. However, Murdorch's list does not include either Jorge's commentary or Pedro Luís'[20] both written in Coimbra and both preceding the publishing of the widely known *Cursus Conimbricensis*. The latter is indeed referred to by Murdoch, but the aforementioned manuscript commentaries ought to now be added to the list. Another relevant aspect of Murdoch's 2001 study is the list of recurring questions regarding the discussion of *minima naturalia*, from which he

[18] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: "An verum sit res naturales habere certum terminum quoad magnitudinem et parvitatem." All transcriptions from the Latin manuscript of Jorge's Physics are ours.

[19] J.E. Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", in *Late Medieval and Early Modern Corpuscular Matter Theories*, ed. Ch. Lüthy, J.E. Murdoch and W.R. Newman (Medieval and Early Modern Science 1), Leiden-Boston-Köln 2001, 91-131.

[20] See n. 12.

organizes his analysis in that article.[21] The set of related questions indicated by Murdoch as recurring in the *minima naturalia* debate is very broad and shows the diversity of approaches and positions taken by the scholastics who addressed this issue.

In his study, Murdoch identifies this debate in texts produced in scholastic contexts from the 13th to the 16th centuries. However, while exemplifying the recurring issues, the diversity of texts and authors addressed by Murdoch does not allow a systematization of theories and interpretations on the *minima naturalia* in which one could include Jorge's position. In addition, Marcos Jorge's commentary on *Physics* I, 4 is scarce on references to authorities.[22] It is therefore difficult to know exactly what his sources are or which authorities he most identifies with in this debate. In any case, there are two aspects that can be stated with certainty. On the one hand, Marcos Jorge recognizes that there are doubts about what Aristotle's position on the limits of natural bodies exactly was.[23] On the other hand, Marcos Jorge has a well-defined position here. He supports this position while interpreting Aristotle's second argument against Anaxagoras and circumscribes the discussion about the *minima naturalia* to the issue of natural bodies' limits, that is to say, about *sensibilia*.

This approach is in fact in line with the subjects Murdoch mentions as recurring, discussed in the tradition of commentary to *Physics* I,4. In Jorge's view, limits of natural bodies undeniably exist and are determined according to the relationship between the material and formal principles of natural entities, and the accident of "quantity." According to Marcos Jorge, natural bodies are effectively delimited in terms of their "greatness" or "smallness." Thus, right at the beginning of his

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[21] Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", 102.

[22] Marcos Jorge often refers to the Greek commentaries by Philoponus, Themistius and Simplicius. However, it is impossible to know if he actually handled them or if he knew them through indirect sources. In the final part of his exposition, he discusses Caetano and Scotus' positions as diverging from his, but it is also not possible to know whether he checked these authorities firsthand. In *Physics* I, 4 Thomas Aquinas is only quoted once, alongside Aristotle's Greek commentators, to corroborate the latter opinion.

[23] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: "Circa illud quod Aristotelis dixit in secunda ratione contra Anaxagoras dubitatur. An verum sit res naturales habere certum terminum quoad magnitudinem et parvitatem […]."

analysis of whether there are maximum and minimum limits for natural entities, and to explain how these limits should be understood, Marcos Jorge presents a conceptual mechanism, elaborated from a set of distinctions, under which these limits should be understood. He then provides a detailed description of this mechanism. At the end of the discussion on the way matter delimits the form of natural entities – which involves a thorough analysis, extending from his commentary to *Physics* I, 4 to the end of the commentary on *Physics* I, 8 – Marcos Jorge presents a diagrammatic representation, similar to that known in Logics as "square of oppositions," to disclose the relations between maximums and minimums that can be verified in natural beings. This diagram is reproduced in Figure 2.

In his analysis and resolution of this issue, Marcos Jorge carries out the following methodology. He starts by taking a definite position, in the discussion originated from Aristotle in *Physics* I, 4 about the limits of natural bodies. Unquestionably, *naturalia* are limited. He then presents the conceptual mechanism behind which the limits of *naturalia* are to be understood. Finally, he applies this mechanism of determining the maximum and minimum limits for *naturalia* to the main affections that he considers occurring in natural bodies: growth/development – the limit *ad quem naturalia* can reach in that process; generation – the limit *in quo* it is possible for them to generate themselves; and conservation – the limit *in quo* it is possible for them to persist in existence.

The adoption of this conceptual mechanism links to an option of Aristotelian interpretation, from the part of Marcos Jorge, concerning the structure and composition of natural entities. In what follows, our analysis will focus on two aspects that show how Marcos Jorge conceives the mechanism of interpreting the limits of natural entities: the conceptual description of the *naturalia* as the mechanism behind the diagram; and the result of applying this mechanism to the problem of the limits. Both – conceptual description and the mechanism performed in the diagram – bear Jorge's philosophical position about the structure of natural bodies.

3. The heuristic effectiveness of the conceptual mechanism of *minima naturalia*

According to Marcos Jorge, the question of the limits of natural entities can be analyzed in two ways: either in relation to the thing itself (*de re*) or concerning its mode of being (*de modo*).[24] The question on *de re* is formulated as such:

> Whether it is true that natural things have an exact limit as to greatness and smallness [;] (...) whether actually natural things have an exact limit, or none at all, such that to any great man a greater [limit] cannot be given, neither can a small [limit] be given to a small man, and this without limit.[25]

The question on *de modo* follows the aforementioned statement that things have a natural limit *de re*. Now, natural limits can be considered either intrinsically or extrinsically;[26] and both can be verified either in the greatness or in the smallness of a natural thing. Jorge's conceptual mechanism aims to map the way in which limits arise in natural things. His detailed analysis of the question is precisely the one he later summarizes in the form of a diagram. Therefore, and despite being considerably long, we find it relevant to reproduce here the complete text in which he describes this mechanism.

According to Jorge, natural things, in terms of greatness and smallness, are limited in two ways: intrinsically and extrinsically.[27] However, as we have seen before, this subdivision follows a previous division – *de re* and *de modo*. Therefore, the scheme that will explain the ques-

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[24] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: "ut igitur quaestionem hanc dilucide resolvamus, notandum primum est, quaestio esse posse et de re ipsa et de modo."

[25] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: "An verum sit res naturales habere certum terminum quoad magnitudinem et parvitatem[;](...) , de re quid est, an revera res naturales habeat certum terminum, scilicet, nullum ita ut quocumque homine magno dato possit dari maior et quocumque parvo dato possit dari minor et hoc sine termino".

[26] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: "supposito enim quod res naturales habent terminum de modo vero potest esse quaestionis, quari potest qualis nam sit terminus, intrinsecus scilicet an extrinsecus."

[27] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, fol. 51v: " (…) res naturales dupliciter posse terminari, uno modo extrinsece, alio vero intrinsece, et hoc tam respectu magnitudinis quam respectu parvitatis".

tion of the limits of natural bodies is actually fourfold. With regards to greatness, intrinsic and extrinsic limits are described as such:

> To a [natural] thing, to be intrinsically limited regarding greatness is to have an exact limit beyond which it is unable to go; conversely, to be limited externally is not being able to be given a limit which it can reach, but within whatever [limit] it could be smaller.[28]

As for smallness, the same limits are described in this way:

> to be intrinsically limited as to smallness [means that] there can be such a limit of smallness in which a thing can exist that in no case can it be smaller; [to be] extrinsically [limited], by contrast, is to be given such a small limit under which a thing cannot exist but [that it could exist] under a greater [one].[29]

Now, limits of this kind of natural entities can be comprised according to the following taxonomy:

> The intrinsic limit of greatness is called '*maximum quod sic*' and indeed it can be explained in this way; for it is the magnitude in which a thing can be, and in no other greater can it be. But the extrinsic limit of greatness is called *'minimum quod non'*, that is, the limit of greatness outside which a thing cannot [be], but it can be within a smaller one.
>
> The intrinsic limit of smallness is called '*minimum quod sic'*, that is, the limit of smalness in which [a thing] can be, but it cannot be in any smaller [limit].
>
> The extrinsic limit [of smallness], however, is called '*maximum quod non*', that is, that limit [of smalness] under which a thing cannot be, but it can be under whatever greater [limit].[30]

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[28] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, ff. 51v-52r: "res terminari intrinsece quoad magnitudinem est res habere certum terminum, ad quem possit pervenire, ita tamen ut illum excedere nequeat; terminari vero extrinsece, est non posse assignari ter-[52r]minum ad quem res pervenire possit in quocumque tamen minori possit".

[29] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, ff. 51v-52r: "Intrinsece vero terminari quoad parvitatem esse posse dari terminum tanta per parvitatis in quo res esse possit in nullo tamen minor possit; terminari autem extrinsice est dari terminum tam parvum, sub quo res esse non possit, sed sub maiori possit."

[30] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, ff. 51v-52r: "Terminus intrinsecus in magnitudinem, dicitur maximum quod sic, scilicet hoc pacto exponitur, nempe est maximum in quo res potest esse, et in nullo maiori potest, terminus vero magnitudinis extrinsecus dicitur minimum quod non, id est, in hoc termino tam magno non potest sed in minori potest. Intrinsecus parvitatis terminus

Marcos Jorge's diagram of *minima naturalia* graphically represents this classification of the limits of natural bodies and the opposing relations between either maximum and minimum or intrinsic and extrinsic limits.

Although it is not possible to establish, based on Jorge's commentary on *Physics* I, 4, the direct or indirect sources of this taxonomy, it is certainly not his. As Murdoch has shown, the Aristotelian theory of *minima naturalia* had its natural evolution in a theory of the minimum and maximum limits of natural entities, being discrete or continuous quantities. Murdoch dates back to the late 14th century the origin of this transformation of Aristotle's *minima naturalia* theory for shaping the limits of natural bodies, pointing out that its use is recurrent throughout the 15th and 16th centuries.[31] Marcos Jorge's explanation can therefore be conceived as part of this tradition, although some nuances should be spotted, namely the making of the diagram itself.

Marcos Jorge considers that these limits only apply to corporeal living beings. Therefore, the limits theory and the correlated mechanism of understanding the structure of bodies does not apply to non-living beings.[32] According to Jorge, the discussion about the limits of natural entities has a very specific focus as it deals with the maximum and minimum limit of corporeal bodies – and particularly of the living ones – within

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dicitur minimum quod sic id est in hoc tam parvo potest, et in nullo minori potest. Extrinsecus vero dicitur maximum quod non, id est, sub hoc tam parvo non potest, sed sub quocumque maiori potest."

[31] Some names mentioned by Murdoch as having incorporated this theory into their explanations of the natural world are Gregory of Rimini, Gaetano da Thienes, Paul of Venice and Didacus de Astudillo (see Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", 118-122).

[32] In Murdoch's view, the correct way to understand this mechanism is precisely its application to discrete quantities: "rightly understood, the *minima naturalia* (at least) should be regarded as discrete quantities." (ibid., 117). In the opposite direction is the text by Gaetano da Thienes, quoted by Murdoch, who applies this mechanism to the nature of fire, a hypothesis also considered, for example, by Paul of Venice or Caetano. The latter is even cited by Jorge, who criticizes Caetano's understanding of the nature of fire under the minima naturalia theory. Marcos Jorge explicitly states that fire can be considered infinite, at least in magnitude, because it will grow whenever more combustible matter is added. The fire, Jorge explains, has a maximum limit only when it encounters a non-combustible matter, which will only happen if it were to reach the empyrean heaven. In this particular case, Jorge clearly adopts the Aristotelian and Ptolemaic tradition to explain the natural world, admitting that heavenly entities are incorruptible and therefore not combustible.

their own specie.[33] To give an explanation of this issue and of those related with it, he analyzes the maximum and minimum limits of the *sensibilia* under three different perspectives: the limit *ad quem* that can be reached by a thing; the limit *in quo* in which things can be generated and the limit *in quo* in which they can be preserved.[34] By applying the aforementioned mechanism to the limits of natural bodies, Jorge comes to a set of conclusions concerning their essence, which can be summarized as follows:

> Regarding the maximum limit:[35]
>
> 1. all living beings have a fixed limit of greatness and smallness;
>
> 2. as regards greatness living beings are intrinsically limited by natural growth by a maximum quod sic, that is, there is a maximum of greatness that living beings can reach by growth, so that they cannot reach [greatness by natural growth] in a greater [limit];
>
> 3. by its very nature, however, it is not incompatible that natural non-living bodies, should infinitely grow, as in the case of " (...) fire whose own nature would not be contradict were it infinitely submitted to fuel.";
>
> 4. (…) as for the generation of living beings, there is a maximum of matter in which they can be generated, that is (…), in which being can appropriately be introduced and it cannot be [introduced] in no greater [quantity of matter];

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[33] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 4, ff. 52r-52v: "Est ergo sensu quaestionis. An res naturales cuiuscumque speciei ita terminetur quoad sumum et quoad minimum, ut nulla res in ea specie possit [52v] dari maior vel minor."

[34] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 4, ff. 52r-52v: "Ut quaestionem satisfaciamus primo agemus de termino magnitudinis et hoc quoad ista tria – primo de termini ad quem res possunt pertingere, 2º de termino in quo possunt generari, 3º de termino in quo possunt conservari, deinde agemus de termino parvitatis etiam secundum ista tria."

[35] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 4, ff. 52-53v: "1. Omnia viventia habent certum terminum magnitudinis et parvitatis; 2. viventia terminatur quoad magnitudinem intrinsece per augmentationem naturalem per maximum quod sic id est datur maxima magnitudo ad quam viventia per augmentationem devenire possunt, ita ut in maiore non possit; 3. (…) igni ex sua natura non repugnat crescere in infinitum, si infinita conbustibilia ei applicaretur; 4. (…) de generatione viventium datur maxima materia in qua possunt generari viventia id est datur maxima materia in qua próprie potest introduci et in nulla maiore possit; 5. (…) de termino magnitudinis secumdum viam corruptionis non datur magnitudo maxima, in qua vivens possit conservari ita ut in maiori non possit, immo datur mínima in qua non potest sed in maxima potest".

> 5. As for the limit of greatness according to the process of corruption, there is no maximum of greatness in which a living being can be maintained that it cannot be maintained itself in any greater [one]; but there is a minimum of greatness in which a living being cannot preserve itself, but it can [be maintained] in a maximum [one].

Regarding the minimum limit:[36]

> 1. all natural beings, both homogeneous and heterogeneous, are limited by their smallness and concerning heterogeneous there is no doubt;
>
> 2. (…) speaking of generation, there is a minimum matter in which , at the beginning [of generation], a substantial form can be introduced;
>
> 3. (…) speaking of growing, as regards natural growth living beings are limited by 'minimum quod sic';
>
> 4. (…) speaking of maintenance of natural entities, there is no minimum quantity in which things can be maintained, but there is a maximum quantity in which they cannot.

This set of conclusions derives from Jorge's strategy to correctly determine the limits of natural bodies, aiming to thoroughly understand the intrinsic structure of such bodies. This strategy was also useful to explain the nature of the three main life affections: generation, growth/development and conservation.

Despite the relevance of Jorge's conclusions (such as the necessary disposition of matter for generation processes or its absence in the case of corruption and death, both allowing inter alia for the distinction between health and illness), these conceptual explanations may sound baroque and somewhat detached from reality. He therefore creates this *minima naturalia* diagram as a pedagogical tool for clarifying and memorizing the complex net of conceptual relations between the processes of generation, subsistence and preservation of living beings.

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[36] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 4, ff. 52r-54v: "1. Omnia entia naturalia tam homogenia quam heterogenia terminatur quoad parvitate et de hetherogeniis nulli dubium est; 2. Secunda conclusio est loquendo de generatione, datur minima materia in qua potest primo introduci forma substantialis; 3ª conclusio est loquendo de augmentatione naturalia viventia secundum augmentationem naturalem terminatur per minimum quod sic (…); 4ª conclusio est loquendo de conservatione entium naturalium non datur mínima quantitatis in qua res conservari possunt sed maxima in qua non possunt".

4. Conclusion

Contrary to what Murdoch claims about Benito Perera's position on this mechanism – who seems to have deemed it totally useless –[37] Marcos Jorge, as later Francisco de Toledo, considered it a relevant tool for explaining the structure of natural bodies.[38]

It is precisely to explain the process of natural growth and decrease that Marcos Jorge introduced an explanation of the maximum and minimum limits, and of the intrinsic and extrinsic relations of transformation processes that can occur within these limits.

Jorge's systematic exposition of the theory of limits occurs, as expected, in his commentary on Aristotle's *Physics* I, 4. However, the two diagrams illustrating the explanation of the two questions we mentioned at the beginning, which are discussed in this passage, only appear at the end of the commentary on *Physics* I, 8.[39] In fact, Marcos Jorge analyses in detail, throughout chapters 5 to 8 of his commentary on *Physics,* Aristotle's theory of matter and how this theory, which is focused on an hylomorphic understanding of natural substances, affects natural bodies regarding accidents such as quantity, intensity and time in the generation and corruption process. Therefore, a complete approach to the way Marcos Jorge deals with the problem of *minima naturalia* will have to be complemented with the exegesis of his commentary on chapters 5 to 8 of *Physica* I.

Such a study, which cannot be accomplished here, would reveal that Marcos Jorge's explanation converges with traditional problems

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[37] See Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", 123.

[38] The Commentary on Francisco de Toledo's *Physics* is among those mentioned by Murdoch, alongside the *Comentario Conimbricense*, as one of those that refer to this mechanism. A comparative study of this commentary by Marcos Jorge and Toledo's Commentary on *Physics* shows a great parallelism/identity between long passages of text, regarding this exposition on the limits of natural entities (see for example, Marcus Georgius , *Annotationes in octo physicorum Aristotelis libros*, ff. 53r-55v; Francisci Toleti, *Commentaria, una cum Quaestionibus, in octo libros Aristotelis De Physica auscultatione. Item, in libri Aristotelis De generatione et corruptione*, Coloniae Agrippinae 1585, ff. 24v-25v). This fact shows that this was common practice in Jesuit philosophy teaching.

[39] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 4-I, 8, ff. 43v-69r.

engaged in the so-called "Limit Decision Controversy."[40] Beginning in the Middle Ages, this debate has its background in a broader set of texts from Aristotle's *Physics*.[41] As Murdoch has also shown, especially from the 14th century onwards, questions concerning *minima naturalia* and the limit decision problem tend to converge. Issues on "the first and last instants of a permanent entity"[42] or on "the insertion of *minima* and *maxima naturalia* into minimal and maximal limits"[43] are developed exhaustively in Jorge's commentary on *Physics* I, 5-8. Marcos Jorge's analysis of these problems is clearly concerned with defining the nature of the material principle of natural entities. This problem, however, is part of a much broader controversy. The conceptual content of the maximum and minimum limits diagram – together with the content of the diagram infinity knowledge not explored here – allows Jorge to identify, in *Physics* I, 5, the way in which contraries originate from contraries without ambiguity;[44] in *Physics* I, 6, principles are said to be finite in number – matter, form and privation,[45] and

[40] J.E. Murdoch, "Propositional Analysis in Fourteenth-Century Natural Philosophy: A Case Study", in *Synthese* 40-1 (1979), 118. S. Knuuttila, "Remarks on the Background of the Fourteenth Century Limit Decision Controversies", in *The Editing of Theological and Philosophical Texts from the Middle Ages. Actes of the Conference Arranged by the Department of Classical Languages, University of Stockholm, 29-31 August 1984*, ed. M. Asztalos (Acta Universitatis Stockholmiensis. Studia Latina Stockholmiensia 30), Stockholm 1986, 245-261.

[41] A brief explanation of this problem from a reading of Aristotle's *Physics* is presented by Knuuttila in the same article: Knuuttila, "Remarks on the Background of the Fourteenth Century", 246-251. As evidenced by studies on this problem, the main texts of *Physics* where Aristotle deals with the question of limits, relating them to the problem of motion and time, are: *Physica* III, 1, 200b10-201b15; *Physica* V, 1-2, 224a20-226b18; *Physia* VI, 4-5, 234b10-236b18; and *Physica* VIII, 8, 261b26-265a11. Apart from this text from Knuuttila, see, for example, on the same subject, Murdoch, "Propositional Analysis"; Id., "The Medieval and Renaissance Tradition of Minima Naturalia", 91-132; Id., "Beyond Aristotle: Indivisibles and Infinite Divisibility in the Later Middle Ages", in *Atomism in Late Medieval Philosophy and Theology*, ed. Ch. Grellard and A. Robert (History of Science and Medicine Library 8), Leiden-Boston 2009, 15-38.

[42] See Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", 114-115.

[43] Murdoch, "The Medieval and Renaissance Tradition of Minima Naturalia", 116-121.

[44] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 5, ff. 56v-59r.

[45] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 6, ff. 59r-63r.

finally, in *Physics* I, 7, Jorge states that motion and generation are not merely identical and affirms the permanence of substances throughout accidental transformations.[46]

Marcos Jorge's alignment with the Aristotelian position, when determining the species or forms of natural entities by quantified matter, is clearly directed towards the rejection of the corpuscular origin of material entities and of an explanation of their origin based on a material principle of infinite kind.[47] As Marcos Jorge states in *Physics* I, 8 (thus at the end of the analysis of the material composition of natural beings) Aristotle correctly concluded that ancient philosophers had been profoundly mistaken in explaining the process of natural generation. These mistakes, Jorge highlights, occur "because they did not know the nature of matter."[48]

If we bear in mind that, in addition to the advanced studies in theology and law, philosophy courses such as Marco Jorge's were also the basis for advanced studies in medicine, the conclusions drawn by Jorge about the maximum and minimum limits of natural bodies were certainly useful for those who followed these courses with this intention. For the theologians, this information was also important: it allowed them to understand that the structure of the living beings cannot be understood in the way Anaxagoras did – that is to say, on the basis of an infinitely extensive and homogeneous matter from which entities emerge by extraction.

The correct understanding of the nature of living beings is presented here by Jorge as opposed to Anaxagoras' *sui generis* atomism on the

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[46] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 7, ff. 63r-67r. As Marcos Jorge had already explained in *Physics* I, 2, when discussing the question "Vtrum totum distinguatur realiter suis partibus" (ff. 34v-39r), this distinction is fundamental to understand the principle of permanence of the substances in accidental change. It allows to differenciate the extrinsic nature of unity in compound that subsist as aggregates formed by juxtaposition from the essential unity of subsistence caused in natural bodies by the intrinsic relation between matter and form bare principles.

[47] See Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 5, f. 57r.

[48] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, I, 8, f. 69r: "Concludit Aristoteles quod ex eo veteres ita graviter erraverunt quia non cognoverunt naturam materiae."

one hand, and in line with Aristotle's hylomorphism, on the other. According to the latter view, natural entities are composed of matter and form and are intrinsically affected by the accident of "quantity." It is well known how this question – specifically analyzed in the classes of philosophy while commenting on Aristotle's natural philosophy – had consequences in the way, in theology, the miraculous real presence of Christ in the Eucharist was rationally discussed. Therefore, the knowledge of the theory of *minima naturalia*, associated with the theory of the limits of natural bodies, was also relevant to theologians. This theory shows, on the philosophical level, that all corporeal bodies are limited by the intrinsic substantial unity between form and matter bare principles, and are circumscribed by a certain quantity of matter. For this reason, "a man was never seen like a mountain, or an ant. What indeed nature never does it is believed not to be able to do."[49] A totally different problem, Jorge explains, is the intervention of divine omnipotence in the intrinsic nature of corporeal bodies. Naturally, Jorge considers the possibility of this intervention – which is ultimately the rational basis for understanding the possibility for bread to be transformed into the body of Christ. And, according to him, in the case of this divine intervention, it is also omnipotence that preserves the new transformed substance.[50]

It is not possible to know exactly what reason led Marcos Jorge to draw this diagram, together with the other diagram – reproduced here, but not analyzed – concerning the possibility of knowing the infinite. However, these diagrams certainly denote, on the part of Marcos Jorge, the awareness about the relevance of the displayed theories as well as his desire to make them more easily comprehensible. In the case of the limits diagram, the significance that Marcos Jorge gives to this issue is visible in the conclusions he drew concerning the nature of natural bodies. The diagram is certainly suitable for a better understanding of the nature of living beings and specifically of humans, whose science is definitely the responsibility of the physicians. But this very fact enables

[49] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, f. 52r: "[…] nusquam visus est homo ut mons, aut formica quod autem naturam nunquam facit censetur non posse facere."

[50] Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, f. 52v: "quaestio esse de eo quod natura rerum potest, et non de eo quod potest Deus facere"; f. 56r: "dicendum est quod sicut deus miraculose dividit, partes miraculose conservabit."

theologians to see that overcoming natural limits is only possible by a supernatural power and how, even in these cases, the structure of the *naturalia* is preserved.

Universidade do Porto

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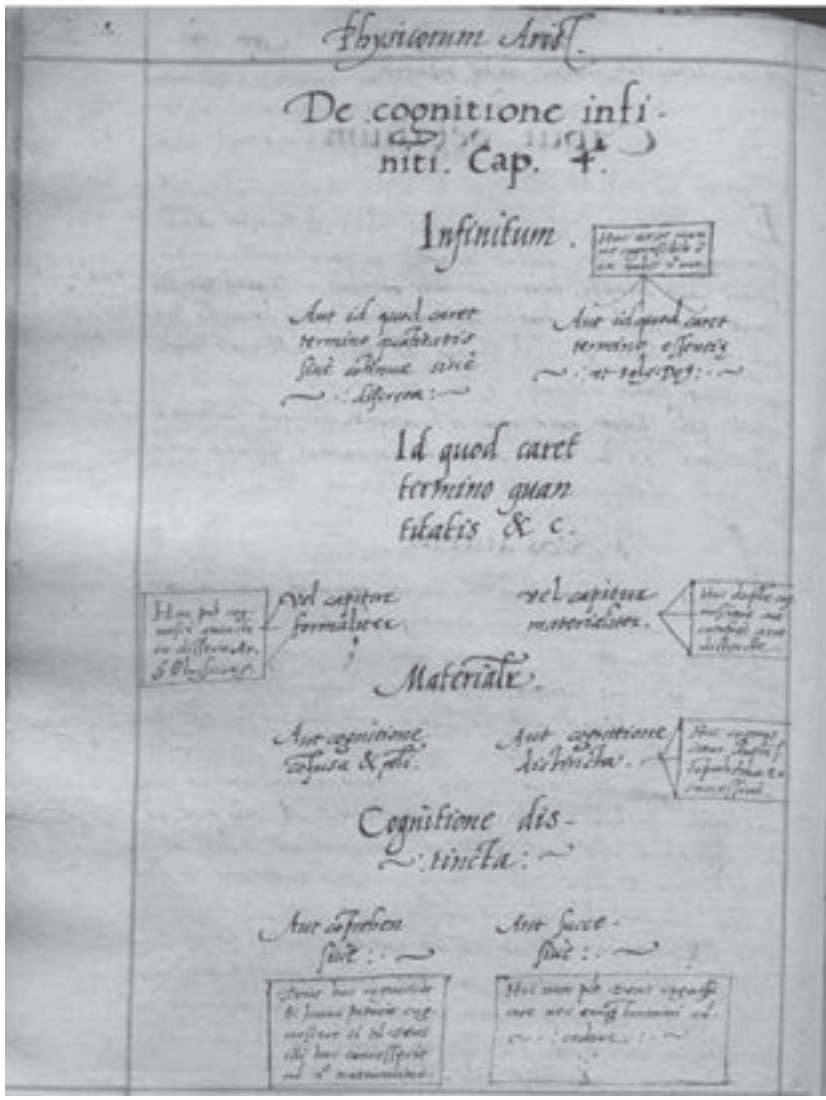

Fig. 1 Diagram on the Knowledge of Infinite Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, Patrimonio Nacional. Real Biblioteca del Monasterio de El Escorial, J III 3, f. 67v. See: https://rbdigital.realbiblioteca.es/s/rbme/page/t-rminos-de-uso

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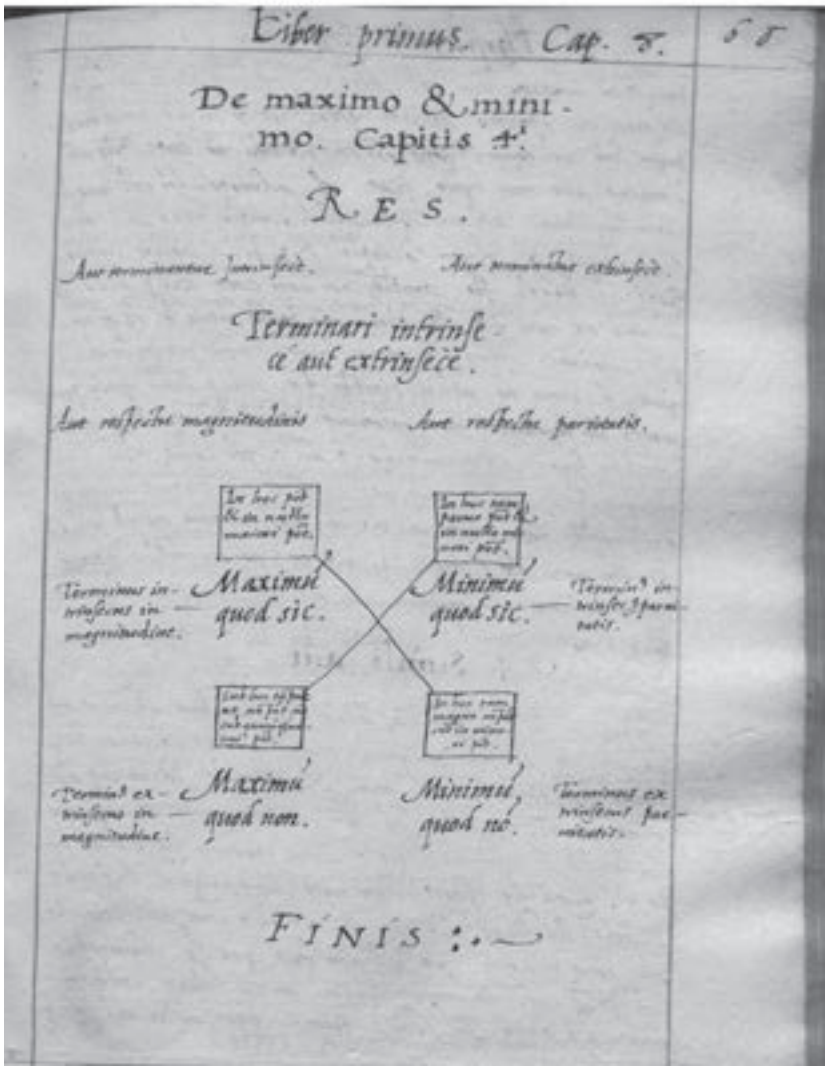

Fig. 2. Diagram on *Minima Naturalia* Marcus Georgius, *Annotationes in octo physicorum Aristotelis libros*, lib. I, 4, Patrimonio Nacional. Real Biblioteca del Monasterio de El Escorial, J III 3, f. 68r.

Ockham and Wodeham on Perceptual Experience

Nicolás Vaughan

I. Introduction

Over the past four decades there has been an increasing interest in late-medieval theories of cognition and meaning. The impressive work recently done by scholars like P. V. Spade, P. King, C. Panaccio, M. M. Adams, E. Karger, among many others, is a clear sign of such a resurgence. One of the more prominent debates in the current academic scene has been the interpretation and assessment of medieval theories of mental content, mainly that of William of Ockham's. Panaccio initially,[1] shortly thereafter followed by a group of scholars,[2] put forward

[1] See C. Panaccio, *Ockham on Concepts*, Aldershot 2004; Id., "Ockham's Externalism", in *Intentionality, Cognition, and Mental Representation in Medieval Philosophy*, ed. G. Klima, Bronx, New York 2015, 166-185; Id., "Intuition and Causality: Ockham's Externalism Revisited", in *Quaestio* 10 (2010), 241-253; Id., "Concepts as Similitudes in William of Ockham's Nominalism", in *Proceedings of the Society for Medieval Logic and Metaphysics* 4 (2004), 18-24; Id., "Linguistic Externalism and Mental Language in Ockham and Buridan", in *Questions on the Soul by John Buridan and Others. A Companion to John Buridan's Philosophy of Mind*, ed. G. Klima, Cham 2017, 225-238; C. Panaccio and D. Piché, "Ockham's Reliabilism and the Intuition of Non-Existents", in *Rethinking the History of Skepticism: The Missing Medieval Background*, ed. H. Lagerlund (Studien und Texte zur Geistesgeschichte des Mittelalters 103), Leiden 2010, 97-118.

[2] P. King, "Thinking About Things: Singular Thought in the Middle Ages", in *Intentionality, Cognition, and Representation in the Middle Ages*, ed. G. Klima, Bronx, New York 2015, 104-121; Id., "Rethinking Representation in the Middle Ages. A Vade-Mecum to Medieval Theories of Mental Representation", in *Representation and Objects of Thought in Medieval Philosophy*, ed. H. Lagerlund, (Studien und Texte zur Geistesgeschichte des Mittelalters 103), Ashgate 2007, 81-100; G. Klima, "Semantic Content in Aquinas and Ockham", in *Linguistic Content: New Essays in the History of Philosophy of Language*, ed. M. Cameron and R. J. Stainton, Oxford 2015, 121-135; M. Lenz, "Why Can't Angels Think Properly? Ockham Against Chatton and Aquinas", in *Angels in Medieval Philosophy Inquiry: Their Function and Significance*, ed. I. Ir-

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a persuasive *externalist* reading of Ockham's theory of mental content. Other scholars have since reacted to Panaccio's proposal, arguing instead that Ockham held an *internalist* theory.[3]

This burst of interest in Ockham's theory of mental content has somewhat overshadowed the research in late-medieval theories of perception. The reason for this might be that in Ockham, as in most scholastic philosophers, theories of cognition, perception, and meaning all converge in a single notion – intuitive cognition. Recent research has focused on it from the vantage point of theories of mental or linguistic content. For the most part, however, its essential role as the prime constituent of perceptual experience has been disregarded. Questions such as, "What makes veridical perceptual experiences essentially different from illusory ones?" "What is perceived when one is in a hallucinatory state?," and the like, have risen little attention among the specialists. Or if it has, it has been in relation to scepticism and related epistemic issues, not in relation to purely perceptual issues.[4]

RIBARREN and M. LENZ, Aldershot 2008, 155-170; D. PERLER, "Thought Experiments: The Methodological Function of Angels in Late Medieval Epistemology", in *Angels in Medieval Philosophy Inquiry: Their Function and Significance*, ed. I. IRRIBARREN and M. LENZ, Aldershot 2008, 143-153; S. SCHIERBAUM, "Knowing Lions and Understanding Lion: Two Jobs for Concepts in Ockham?", in *Vivarium* 48 (2010), 327-348; ID., *Ockham's Assumption of Mental Speech: Thinking in a World of Particulars*, Leiden-Boston 2014.

[3] S. BROWER-TOLAND, *Late-Medieval Theories of Propositions. Ockham and the 14th Century Debate about Objects of Judgement*, PhD dissertation, Cornell University 2002; ID., "Intuition, Externalism, and Direct Reference in Ockham", in *History of Philosophy Quarterly* 24 (2007), 317-335; ID., "Ockham on Judgment, Concepts, and the Problem of Intentionality", in *Canadian Journal of Philosophy* 37 (2007), 67-110; ID., "How Chatton Changed Ockham's Mind: William Ockham and Walter Chatton on Objects and Acts of Judgment", in *Intentionality, Cognition and Mental Representation in Medieval Philosophy*, ed. G. KLIMA, Bronx, New York 2015, 204-234; ID., "Causation and Mental Content: Against the Externalist Reading of Ockham", in *The Language of Thought in Late Medieval Philosophy*, ed. J. PELLETIER et al., Cham 2017, 59-80; A. MURALT, "Les conséquences de la doctrine occamienne de la toute-puissance divine: La connaissance intuitive d'une chose qui n'existe pas", in *L'enjeu de la philosophie médiévale,* Leiden 1993, 352-407; P. VIGNAUX, *Nominalism au xive siècle*, Montréal-Paris 1948.

[4] Regarding Ockham and Wodeham, a few important exceptions to this generalisation can be cited: D. PERLER, "Seeing and Judging: Ockham and Wodeham on Sensory Cognition", in *Theories of Perception in Medieval and Early Modern Philosophy*, ed. S. KNUUTTILA and P. KÄRKKÄINEN, Dordrecht 2008, 151-169; K. H. TACHAU, *Vision and Certitude in the Age of Ockham: Optics, Epistemology, and the Foundations of Seman-*

My purpose in this paper is to focus on Ockham's and Wodeham's theories of perception. I intend to construe Ockham's theory of intuitive cognition from the perspective of Wodeham's interpretation of it. As it is well known,[5] besides having been his secretary for some time, Wodeham was one of Ockham's closer followers and defenders. This, however, was no obstacle for Wodeham to criticise, complement, and correct his master's teachings. I believe our understanding of Ockham's theory can benefit from the insights provided by Wodeham's analysis.

I contend that Ockham's over-optimistic account of naturally and supernaturally produced intuitive cognitions is shattered by Wodeham's realisation that no intuitive cognition can be so certain as to be immune to God's absolute power. The upshot is that we must abandon Ockham's original definition of intuitive cognitions, which identified them as belonging to a unique, essentially conjunctive (or homogeneous) class. Wodeham's new definition thus breaks that homogeneity, by identifying an essentially disjunctive class composed of two non-overlapping varieties of perceptual experience – veridical intuitive cognitions and non-veridical intuitive cognitions.

I proceed as follows. In §II, I examine Scotus' and Ockham's accounts of the distinction between intuitive and abstractive cognitions, in order to show the rationale behind Wodeham's characterisation of Ockham's definition of the former as formally being of "conjunctive predicate." In §III, I examine Wodeham's objections to both Scotus' and Ockham's accounts. Finally, in §IV, I contend that these objections compel Wodeham to formulate a "disjunctive predicate" definition of intuitive cognitions, and ultimately to put forward an innovative account of the nature of perceptual experience.

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tics, 1250-1345, c. 5 and 10 (Studien und Texte zur Geistesgeschichte des Mittelalters 22), Leiden 1988; R. Wood, "Adam Wodeham on Sensory Illusions With an Edition of *Lectura Secunda*, Prologus, Quaestio 3", in *Traditio* 38 (1982), 213-252; M. Pickavé, "Peter Auriol and William of Ockham on a Medieval Version of the Argument From Illusion", in *The Language of Thought in Late Medieval Philosophy,* Cham 2017, 183-199. Even Adams' monumental monograph tends to conflate epistemic and perceptual issues. See M. M. Adams, *William Ockham*, Notre Dame, Ind. 1987, c. 14.

[5] See the editors' introduction to Guillelmus de Ockham, *Summa logicae*, ed. P. Boehner, G. Gál et S. Brown (Opera philosophica 1), St. Bonaventure, N.Y. 1974; W. J. Courtenay, *Adam Wodeham. An Introduction to His Life and Writings*, Leiden 1978, 160-164; Id., *Ockham and Ockhamism. Studies in the Dissemination and Impact of His Thought*, Leiden-Boston 2008, 120-124.

II. Scotus and Ockham on Perception

Ockham's theory of perception hinges on a new understanding of a distinction between two ways the mind can apprehend individuals, namely, "intuitive cognitions" (*notitiae intuitivae*) on the one hand, and "abstractive cognitions" (*notitiae abstractivae*) on the other.[6]

Most scholars agree that the intuitive-abstractive distinction was first put forward by the English philosopher John Duns Scotus (c.1266-1308),[7] who ultimately chartered it in terms of the *objects* of congnition. Whereas intuitive cognitions essentially require the existence and presence of their singular objects, abstractive cognitions do not.[8] In other words, Scotus claimed that for someone to have an intuitive cognition of a particular object, that is, to actually *perceive* it, it is necessary that the object exist and be present. By contrast, for someone to have an abstractive cognition of that object, that is, to think about, imagine, or remember it, its actual existence and presence are not required at all.

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[6] See Guillelmus de Ockham, *Ordinatio* I, Prol., q. 1, a. 1, ed. G. Gál et S. Brown (Opera theologica 1), St. Bonaventure, N.Y. 1967, 16-47; *Reportatio* II, q. 12-13, ed. G. Gál et R. Wood (Opera theologica 5), St. Bonaventure, N.Y. 1981, 256-267; *Quodlibeta septem*, V, q. 5 et VI, q. 6, ed. J. C. Wey (Opera theologica 9), St. Bonaventure, N.Y. 1980, 495-500 et 604-607. Cf. Perler, "Seeing and Judging"; E. Karger, "Ockham's Misunderstood Theory of Intuitive and Abstractive Cognition", in *The Cambridge Companion to Ockham*, ed. P. V. Spade, Cambridge 1999, 204-226 and 216-218; Tachau, *Vision and Certitude*, 278-288.

[7] The literature on Scotus' account of the distinction is overwhelming. See esp. S. J. Day, *Intuitive Cognition: A Key to the Significance of Later Scholastics*, St. Bonaventure, N.Y. 1947, c. 2; J. F. Boler, "Scotus and Intuition: Some Remarks", in *The Monist* 49 (1965), 551-570; S. D. Dumont, "Theology as a Science and Duns Scotus's Distinction Between Intuitive and Abstractive Cognition", in *Speculum* 64 (1989), 579-599; D. C. Langston, "Scotus's Doctrine of Intuitive Cognition", in *Debates in Medieval Philosophy: Essential Readings and Contemporary Responses*, ed. J. Hause, London 2014, 330-347; G. Pini, "Scotus on Intuitive and Abstractive Cognition", in *Debates in Medieval Philosophy*, ed. J. Hause, New York-London 2014, 348-365; Tachau, *Vision and Certitude*; A. B. Wolter, "Duns Scotus on Intuition, Memory and Our Knowledge of Individuals", in *History of Philosophy in the Making: A Symposium of Essays to Honour Professor James D. Collins*, ed. L. J. Thro, Washington D.C 1982, 81-104; Id., "Memory and Intuition: A Focal Debate in Fourteenth Century Cognitive Psychology", in *Franciscan Studies* 53 (1993), 175-230; R. Cross, *Duns Scotus's Theory of Cognition*, Oxford 2014 c. 2-4.

[8] For a rather exhaustive list of the places where Scotus discusses the distinction, see Pini, "Scotus on Intuitive and Abstractive Cognition", 362, n. 1.

In this sense, Scotus' criterion of distinction between intuitions and abstraction can be fittingly described as *present-object* dependency.

Now Ockham strongly disagrees with Scotus on this point. He claims that the intuitive-abstractive distinction cannot be based on the objects of cognition, because both kinds have the very same object, and are conceived under the very same notion (*ratio*).[9] For example, an intuitive cognition of this singular apple, and the ensuing abstractive cognition (the specific concept[10]) of it, both have exactly the same object – this very apple – and both apprehend it under the same notion.

Unlike Scotus, Ockham offers a complex account of the intuitive-abstractive distinction, as he holds that intuitive and abstractive cognitions differ in two ways:

> [1] uno modo, per hoc quod per notitiam intuitivam assentitur primo contingenti, et per abstractivam non; [2] alio modo, per hoc quod per notitiam intuitivam non tantum iudico rem esse quando est, sed etiam non esse quando non est; per abstractivam neutro modo iudico.[11]

This notable passage contains the core of what we shall call Ockham's *power-dependent* definition of intuitive cognitions, and hence of his account of the intuitive-abstractive distinction. As we shall see, the bipartite structure of Ockham's definition will prove essential to Wodeham's own account.

The first part of the definition expresses that intuitive cognitions alone have to power to produce the formation of, and assent to,[12] a

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[9] Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 1, ed. G. Gál et al., 36.15-16: "… idem totaliter et sub eadem ratione a parte obiecti est obiectum intuitivae et abstractivae."

[10] On the evolution of Ockham's theory of the concept, see G. Gál, "Gualteri de Chatton et Guillelmi de Ockham Controversia de natura conceptus universalis", in *Franciscan Studies* 27 (1967), 191-212; F. E. Kelley, "Some Observations on the 'Fictum' Theory in Ockham and Its Relation to Hervaeus Natalis", in *Franciscan Studies* 38 (1978), 260-282; Id., "Walter Chatton vs. Aureoli and Ockham Regarding the Universal Concept", in *Franciscan Studies* 41 (1981), 222-249; Adams, *William Ockham*, c. 3; Tachau, *Vision and Certitude*, 148-153; R. Pasnau, *Theories of Cognition in the Later Middle Ages*, Cambridge 2003, 277-289; Panaccio, *Ockham on Concepts*, c. 2.

[11] Guillelmus de Ockham, *Quodlibeta septem*, V, q. 5, ed. Wey, 496.14-19. For parallel expositions, see *Ordinatio,* I, Prol., q. 1, a. 1, ed. Gál et al., 31-32; and *Reportatio,* II, q. 12-13, ed. Gál et al., 256-257.

[12] Brower-Toland, *Late-Medieval Theories of Propositions*; Id., "Intuition, Externalism"; Id., "How Chatton Changed".

so-called "first contingent proposition," that is, a present-tense, contingent proposition to the effect that a singular thing exists within the perceptual range of the perceiver, or that a singular quality inheres in a singular entity. We shall hereafter refer to such propositions simply as "perceptual judgements."

An intuitive cognition, in sum, is a noncomplex act of awareness of a singular entity (a substance or quality), which *has the power* to bring about the formation of, and assent to, perceptual judgements. By means of these judgements, the perceiver has evident knowledge of actual, contingent facts about that entity (existence, presence, and qualitative inherence).

However, no such facts are knowable by means of an abstractive cognition, since it is essentially powerless to produce perceptual judgements. When someone thinks about (or remembers, or imagines) a certain object, she is enacting an abstractive cognition of it. But of course, this can afford her no knowledge at all as to the existence, presence, or qualitative inherence of the object.

Ockham explains[13] that these cognitions are called "abstractive" for two reasons – because they apprehend their singular entities apart from their actual existence and presence, and because they apprehend them apart from their individuality. Hence, to have an abstractive cognition of a certain singular entity, or equivalently, to form a specific concept of it, is just to apprehend it in its specific unity, independently of its actual existence. Whereas to have an intuitive cognition of a certain singular entity is just to apprehend it in itself, that is, in its numerical unity. This might suggest that even if Ockham's account of the intuitive-abstractive distinction is expressly founded upon the cognitions' *powers* to produce perceptual judgements, it is nonetheless consistent with Scotus' object-dependent account.

It is here, however, where the second part of Ockham's definition becomes critical. For it contains the gist of what has been called his theory of "intuitive cognition of nonexistents" (*ICNE*, hereafter). And it is precisely here, as well, where Ockham's theological commitments become most salient, for better or worse.[14]

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[13] Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 1, ed. Gál et al., 30-31; *Quodlibeta septem* I, q. 13, ed. Wey, 74.

[14] On Ockham's theory of *ICNE*, see Day, *Intuitive Cognition,* 174-188; Vignaux,

Ockham is committed to the view that God is a necessary concurrent cause in all natural causal processes.[15] God is therefore fully capable, according to his absolute power (*de potentia absoluta)*, to *suspend* his own influence in any causal relation, thereby hindering a natural cause from producing its proper effect. But Ockham is also convinced that God can even *replace* the natural cause's powers with his own, while conserving himself the selfsame (*ipsum*) effect; or alternatively, that he can destroy the natural cause, while preserving its selfsame effect. And since the effect remains completely unaltered, God's tampering with natural causation cannot be detected by anyone witnessing or participating in the causal process – unless, of course, God wills otherwise. This is, after all, the metaphysical foundation of miracles.[16]

Nominalism, 12-39; M. M. Adams, "Intuitive Cognition, Certainty, and Scepticism in William Ockham", in *Traditio* 26 (1970), 389-398; P. A. Streveler, "Ockham and His Critics On: Intuitive Cognition", in *Franciscan Studies* 35 (1976), 223-236; P. Boehner, "The Notitia Intuitiva of Non-Existents According to William of Ockham", in *Collected Articles on Ockham*, St. Bonaventure, NY 1992, 268-300; Panaccio and Piché, "Ockham's Reliabilism"; Muralt, "Les conséquences"; E. Stump, "The Mechanisms of Cognition: Ockham on Mediating Species", in *The Cambridge Companion to Ockham*, ed. P. V. Spade, Cambridge 1999, 168-203, 184-188; Karger, "Ockham's Misunderstood Theory", 210-216; A. A. Maurer, *The Philosophy of William of Ockham in Light of Its Principles*, Toronto 1999, 479-490.

[15] Guillelmus de Ockham, *Reportatio,* IV, q. 9, ed. R. Wood, G. Gál et R. Green (Opera theologica 7), St. Bonaventure, N.Y. 1984, 168.4-6: "…Deus est causa partialis respectu cuiuslibet effectus producendi a creatura, concurrens immediate cum omni creatura ad producendum omnem effectum…" See also *Quodlibeta septem,* VI, q. 12 et IV, q. 32, ed. Wey, 632.80-82 et 455-456.18-19; *Ord.* I, Prol., q. 1, a. 1, ed. Gál et al., 35.8-10; *Ordinatio,* I, d. 30, q. 1, ed. G. I. Etzkorn et F. E. Kelley (Opera theologica 4), St. Bonaventure, N.Y. 1979, 287-288; *Summa logicae*, I, q. 50 ed. P. Boehner, G. Gál et S. Brown (Opera philosophica 1), St. Bonaventure, N.Y. 1974, 161.56-58; *De corpore Christi*, c. 13, ed. C. Grassi (Opera theologica 10, 89-235), St. Bonaventure, N.Y. 1986, 115.5-8.

[16] In this regard, both Ockham and Wodeham draw attention in more than one occasion to a certain passage from the Book of Daniel (*Dan*. 3, 19-24 and 46-50). According to it, God suspends the causal powers of fire to produce heat (thereby saving three Hebrew men from burning in a furnace), but he nonetheless conserves its appearance. Ockham appeals to this biblical authority in several places: Guillelmus de Ockham, *Reportatio,* II, q. 3-4, ed. Gál et al., 62.19-20; *Reportatio* IV, q. 9, ed. Gál et al., 168.15-22; *Quodlibeta septem,* IV, q. 13, ed. Wey, 363.92-94.

Now according to Ockham's naturalistic epistemology, perceptual experiences are occurrences of natural causal interactions. They are therefore as prone to divine intervention as any other causal process. It follows that God alone is capable of bringing about a certain intuition in someone's mind, in the absence of its object (either because God has destroyed it, or because he has suspended its causal powers, or finally, because it never even existed). Ockham is clear that, should God will so, a supernaturally produced intuition would be identical, not only specifically but also numerically, to a naturally produced intuition. This means, crucially, that in both cases the cognitions will be *the same entity*, although only in the latter case it will have been naturally produced by an existing singular entity.

It is here where Ockham ultimately parts ways with Scotus. For if it is possible for God alone to produce in someone's mind the *selfsame* intuitive cognition which its object had naturally produced (or would have naturally produced should it existed), then Scotus' object-dependent account of the intuitive-abstractive distinction is simply wrong. It hence follows that, *absolutely speaking*, the two species of noncomplex cognitions cannot be distinguished on account of their relations to their objects. Instead, they are only distinguished on account of their *power* (or lack thereof) to bring about perceptual judgements. For the actual formation of, and assent to, perceptual judgments is the *terminus* of the intuitive cognitive act.[17]

So far, so good. But Ockham's theory of *ICNE* has an unexpected twist within. For suppose that God alone produces a certain intuitive cognition in someone's mind. Now provided that no object exists or, if it does, that it is causally ineffective, we should expect either that no judgement at all will be produced; or if it is, that it will be a *false* but evident judgement of existence, as it was ultimately produced by no object. But this is not what Ockham has in mind. As the passage quoted above explains, and as he consistently holds across his writings, su-

[17] See Guillelmus de Ockham, *Reportatio,* II, q.12-13. ed. Gál et al., 259.4-12: "Et ideo differentiae quas dat Ioannes inter cognitionem intuitivam et abstractivam, quod "cognitio intuitiva est praesentis et exsistentis ut praesens et exsistens est," intelligitur de cognitione intuitiva naturaliter causata, non autem quando supernaturaliter. Unde *absolute loquendo* non requiritur necessario ad cognitionem intuitivam alia praesentia *nisi quod possit actum intuitivum terminare*. Et cum hoc stat quod obiectum sit nihil, vel quod sit distans per maximam distantiam' (my italics).

pernaturally produced intuitive cognitions invariably bring about *true*, evident perceptual judgements of *non*existence.

Interpreters have long debated how to properly construe Ockham's theory of *ICNE*.[18] As we shall see in §2, Wodeham takes Ockham's theory to mean that God is virtually powerless to fool someone into falsely believing that she is perceiving a nonexistent object. The reason, Ockham explains, is that even if God himself produces in someone's mind an intuitive cognition of a nonexistent (or a nonpresent) object, the resulting perceptual judgement is one of *non*existence, and for that matter, a true, evident one.

Now the theological, historical, and philosophical details of this debate are beyond our present concerns. I shall nonetheless make one point in relation to the issue at hand, which will prove relevant to our later discussion.

In Ockham's view, human perceptual experience is actually a complex process consisting of several discrete stages: (1) the formation of the intuitive cognition; (2) the formation of the first abstractive cognition of the same object; (3) the formation of a perceptual judgement; and lastly, (4) the assent to it.[19] A consequence of such a complexity is that, contrary to what Ockham's theory of *ICNE* purports, God appears to be fully capable of deceiving us in a variety of ways. For example, God could immediately bring about in someone's mind an intuitive cognition of a nonexistent object (stage 1), while at the same time he could produce a false, evident perceptual judgement of the object's existence (stages 3 and 4), thereby fooling her into falsely believing that it exists.

To be sure, Ockham is aware of the possibility of this and other varieties of divine deception.[20] And yet he entirely neglects it in his theory of *ICNE* without caring to explain why he does so. At any rate, it is clear that there exists a theoretical tension between Ockham's epistemic

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[18] See n. 14 above for references on this debate.

[19] In his mature writings, Ockham combines the last two moments into one single stage. See references in n. 10 above.

[20] See esp. Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 6, ed. Gál et al., 70.16-20, as well as the references to miraculous deceptions in n. 16 above. Cf. Karger, "Ockham's Misunderstood Theory" for a discussion, and Id., "Ockham and Wodeham on Divine Deception as a Skeptical Hypothesis", in *Vivarium* 42 (2004), 225-236, for a refinement of her view.

optimism, as expressed in the second part of his definition of intuitive cognitions, and his overt recognition of the possibility of divine tampering in the later stages of the perceptual process. Indeed, Wodeham attentively calls attention to this precise tension, while seeking to undermine the purported infallibility of both naturally and supernaturally produced intuitive cognitions, as we shall discuss in the next section.

Now my point is not that Ockham did not conceive of the possibility of delusive intuitions. In fact he did, and he referred to them as "imperfect" or "obscure" intuitive cognitions.[21] My point is rather that what Ockham calls "perfect" intuitive cognitions are essentially *infallible* acts of noncomplex awareness of singulars, in the sense that they are *invariably* productive of true, evident perceptual judgments concerning them (whether they exist or not); in very much the same way as "perfect" fire is invariably productive of heat, and as "perfect" humans are invariably productive of reasoning. Hence in examining of Ockham's theory of perception, we will only be concerned with such "perfect" intuitions.

Accordingly, the upshot of Ockham's reasoning for his theory of *ICNE* is the contention that there exists precisely one, essentially homogeneous species of intuitive cognitions. Its very essence – to be capable of producing true, evident perceptual judgements – remains identical regardless of its natural or supernatural origin, as well as of its object's existence or nonexistence.

He considers two arguments for this contention – one supernatural, the other natural. The first one we have discussed already. It is the claim that God alone can produce the very same effect which any natural cause can also produce. And thus a naturally produced intuition can be of the same kind as a supernaturally produced intuition – or, should God will to, it could even be numerically the same intuition.

The second argument, on the other hand, is Ockham's explanation of why an intuition produces a true perceptual judgement of existence when acting in tandem with its object, yet it produces a true judgement of *non*existence when acting alone, rather than a false judgement of existence, or simply no judgement at all, as could be reasonably expected. According to Ockham, certain causes can bring about a certain

[21] See Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 1, ed. Gál et al., 33.8-12.

effect when acting alone (as "total" causes), while they can bring about the *opposite* effect when acting in cooperation with other causes (as "partial" causes).[22] And this is what happens, he claims, with intuitive cognitions.

Notwithstanding the dubious merits of such an argument – which Wodeham takes to be a "mere evasion," as we shall see below – what concerns us now is this. For Ockham, it is the *selfsame* (*ipsa*) intuitive cognition which has the power to bring about diverse effects, depending on whether it acts alone or in tandem with its object.[23] This recognition is crucial for our present examination, as it underscores the fact that naturally and supernaturally intuitive cognitions are essentially identical mental acts of awareness.

Let us call the power to produce perceptual judgements of existence or of nonexistence, depending on their acting alone or in tandem with other causes, a *dispositional* property of intuitive cognitions (just as, for example, the power to shatter under certain conditions is a dispositional property of glass). Now because this dispositional property is essential to *any* intuitive cognition, it follows that it can*not* be claimed to constitute a difference between distinct species of intuitive cognitions. And this entails that naturally and supernaturally produced intuitive cognitions are essentially the same kind of mental act.

> (*E*) capable of producing true, evident perceptual judgements of existence, if the thing exists; and
>
> (*N*) capable of producing true, evident perceptual judgements of *non*-existence, if the thing does *not* exist,

are jointly verified of a single subject, "intuitive cognition" (*I*), which is the *definiendum* of the definition.

We shall accordingly put forward the following schema of Ockham's "conjunctive-predicate" definition:

> (*CPD*) *I* is (*E* and *N*),

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[22] See Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 6, ed. G. Gál et al., 71.2-4: "… non est inconveniens quod aliqua causa cum alia causa partiali causet aliquem effectum et tamen quod illa sola sine alia causa partiali causet oppositum effectum."

[23] See Guillelmus de Ockham, *Ord.* I, Prol., q. 1, a. 6, ed. G. Gál et al., 71.4-7: "… notitia intuitiva rei et ipsa res causant iudicium quod res est, quando autem ipsa res non est tunc *ipsa* notitia intuitiva sine illa re causabit oppositum iudicium" (my italics).

where the parentheses serve to convey that the two predicates are *jointly* predicated of the subject. This schema succinctly expresses Ockham's contention that intuitive cognitions conform a single, unified (or "conjunctive') species, irrespective of their origin, and of their object's existence and presence.

Let us wrap up this section with the following remarks. In Ockham's theory of perception, both *E*-type and *N*-type intuitive cognitions essentially share a *common ground* which involves three distinct aspects, namely:

1. Phenomenically, they are both the *same type of conscious manifestation*, as they are necessarily indistinguishable from one another under introspective reflection.

2. Psychologically, they are both the *same type of mental act*, regardless of their origin. (Indeed, per God's absolute power, they can even be the same token of mental act.)

3. Epistemically, they are both the *same kind of perceptual experience*, as they are naturally apt to produce the same kind of knowledge. The fact that, in one case, the judgement is of existence, while in the other is of nonexistence, is epistemically inconsequential.

The claim that there exists such a common ground between *E*-type and *N*-type intuitive cognitions, is tantamount to the claim that they belong to one essentially homogeneous species. On account of their common power to produce perceptual knowledge, they differ in species from abstractive cognitions, with whom they exhaustively conform the genus of noncomplex acts of awareness. In the following section we shall see how Wodeham seeks to undermine Ockham's purported homogeneity.

III. Wodeham on God and Cognition

Interpreters[24] have for the most part taken Wodeham's account of the intuitive-abstractive distinction as being more akin to Scotus' position

[24] Tachau, *Vision and Certitude*, c. 8, esp. 278-279; J. T. Slotemaker and J. C. Witt, "Adam de Wodeham", in *The Stanford Encyclopedia of Philosophy*, ed. E. N. Zalta, 2019, § 4.1 <https://plato.stanford.edu/entries/wodeham/> (accessed: 13/07/2022). But compare B. D. A. Langridge, *"Nisi Deus Decipiat": Adam Wodeham on Evident Knowledge*, PhD dissertation, The University of Guelph 2015, 35ff, for a more balanced examination.

than to Ockham's. Admittedly, Wodeham himself suggests as much when he explains that

> … rationabilis est illa differentia quam ponit Scotus ubique … inter intuitivam et abstractivam, quod videlicet abstractiva potest esse indifferenter exsistentis et non exsistentis, praesentis et non praesentis, intuitiva tantum praesentis realiter et exsistentis. Haec potest naturaliter esse differentia, quia haec naturaliter requirit praesentiam rei, illa non.[25]

Wodeham is clearly focused on *naturally* produced intuitive cognitions alone, that is, those falling under the *E*-predicate of Ockham's *CPD*. Indeed, he immediately dismisses a suggestion by Ockham to the effect that certain remarks of Scotus' could be read as supporting the thesis that "there can supernaturally be an intuitive cognition without the existence of the object".[26] And he then states his sympathy with Peter Auriol's rejection of Ockham's theory of *ICNE*, as expressed in the *N*-predicate of the *CPD*. Still, Wodeham's positive account of the intuitive-abstractive distinction is remarkably closer in spirit to Ockham's position than to Scotus':

> Omnis notitia incomplexa aliquorum *quae potest naturaliter esse causa* notitiae evidentis respectu propositionis contingenti de praesenti, vel rei significatae per talem propositionem, realiter et specifice distinguitur a notitia incomplexa illorum *quae* quantumcumque intendantur *non potest esse causa* assensus evidenti respectu eiusdem vel dissensus.[27]

Wodeham's prime concern in this passage is the kind of *effect* the two species of noncomplex cognitions can have upon the mind, that is, their *causal powers*. He is clearly following in Ockham's footsteps in his claim that the distinction cannot be established on account of the cognitions' objects. For, as he later declares, both kinds of cognitions have the same object, understood under the same notion.[28]

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[25] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 2, ed. R. Wood et G. Gál, Vol. 1, St. Bonaventure, N.Y. 1990, 44-45.21-27.

[26] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 2, ed. Wood et Gál, 45.29-30. Ockham's suggestion is found in Guillelmus de Ockham, *Ordinatio*, I, Prol., q. 1, a. 1, ed. Gál et al., 35.4, and refers to Scotus, *Opus Oxoniense,* III, d. 14, q. 2, a. 2, ed. L. Wadding (Opera omnia 7-1), 285, as the editors of Ockham's *Ordinatio* and of Wodeham's *Lectura secunda* explain.

[27] Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 2, ed. Wood et al., 35.10-14 (my italics).

[28] Cf. Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 7, ed. R. Wood et al.,

Indeed, Wodeham explains that the difference between the two species becomes known

> …non…*ex obiectis*, sicut aliqui videntur dicere … . Sed innotescit *ab effectu*, quia scilicet intuitiva notitia est cognitio necessario requisita ad iudicium evidens veritatis contingentis naturaliter causandum, et qua posita—perfecta, et non exsistente impedimento—tale iudicium est naturaliter causabile. Non sic de abstractiva quacumque. Et etiam innotescit *a causa*, quia una requirit causam specifice distinctam a causa alterius.[29]

So Wodeham evidently appears to be aiming for a compromise between Scotus' and Ockham's positions. He agrees with both authors that intuitive cognitions *normally* require their objects as partial, effective causes, while abstractive cognitions never do. But unlike Scotus, Wodeham disputes that this amounts to the claim that the two species of noncomplex cognitions are essentially distinguished by their objects. And hence he concurs with Ockham in embracing a power-dependent account rather than an object-dependent one of the distinction.

As we saw earlier, Ockham had dismissed as "imperfect" any intuition which could bring about delusive perceptual judgements. In his view, only those noncomplex acts of singular apprehension which can invariably produce perceptual knowledge deserve to be called "intuitive cognitions" proper. However, Wodeham strongly disagrees with such an over-optimistic stance. He holds instead that there is nothing diminished, imperfect, or obscure in an intuitive cognition conducive to perceptual deception. And this is the case regardless of the cognition's supernatural or natural origin. The upshot of Wodeham's fallibilist stance is, therefore, the rejection of Ockham's theory of *ICNE*.

The disagreement between Ockham and Wodeham is not merely semantic. That is to say, the issue at hand in not whether we should or should not refer to delusory acts of singular awareness as "intuitive cognitions". Rather, the disagreement concerns the very nature of perceptual experience. For whereas Ockham had claimed that there exists a *common ground* to all perceptual experiences, Wodeham unambiguously denies it. Let us explain this point in more detail now.

44.7-8: "…idem totaliter et sub eadem ratione a parte obiecti est obiectum intuitivae et abstractivae.' (For Ockham's formulation, see n. above.)

[29] Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 2, ed. Wood et al., 44.5-16 (editors' italics).

Admittedly, the most salient point of contention between Ockham and Wodeham is the *epistemic* status of supernaturally produced intuitive cognitions. Wodeham outright dismisses all claims of knowledge regarding such cognitions, and accordingly emends Ockham's definition:

> … notitia intuitiva, quae re exsistente est virtute cuius potest sciri res exsistere, non est virtute cuius possit sciri non exsistere ipsa *non* exsistente.[30]

Wodeham evidently regards Ockham's theory of *ICNE* as mistaken. Yet this is not because he deems Ockham's account of God's absolute power hyperbolic and hence unacceptable, as some contemporaries had done. As a matter of fact, Wodeham unconditionally embraces Ockham's radical divine voluntarism, according to which God's absolute power is only constrained by sheer logical contradiction.[31]

Precisely because of this, he considers that Ockham's theory of perception has transgressed the limits dictated by such a view. For, when taken at face value, Ockham's radical voluntarism undercuts the alleged infallibility, or – as he will later say – the intrinsic "certifiability," of supernaturally produced intuitive cognitions. Hence, the core of Wodeham's fallibilism can be expressed as follows. No intuitive cognition is so certain (so "perfect') as to curb God's absolute power to interfere with our perceptual process, and thus to effectively deceive us. Wodeham's *theological fallibilism*, as we shall refer to this view, calls for a new definition of intuitive cognitions. He offers three arguments for such a view.

The first one[32] is an *ad hominem* attack which seeks to expose as a "mere evasion" Ockham's puzzling causal reasoning behind his theory of *ICNE*. And the third one[33] is an appeal to scriptural authority[34] to

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[30] Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 4, ed. Wood et al., 38.4-6 (my italics).

[31] See e.g. Adam de Wodeham, *Lectura secunda,* d. 1, q. 1, a. 12, ed. Wood et al., 201.52-53: "…Deus potest facere quidquid non includit contradictionem"; *Lectura secunda,* d. 8, q. 1, a. 11, ed. Wood et al., Vol. III, 23.33-35: "…non debe negari a divino posse de quo non patet nec probatur quod includat contradictionem…".

[32] Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 4, ed. Wood et al., 39.18.

[33] Adam de Wodeham, *Lectura secunda,* Prol., q. 2, § 4, ed. Wood et al., 40.42-50.

[34] *Dan*., 3, 19-23 and 46-50 (*Vulgata*). See n. above.

the effect that God is reputably capable of producing delusive intuitive cognitions in human beings.

The second argument,[35] on the other hand, seeks to reject the core of Ockham's theory of *ICNE*, by exposing an absurdity which follows from it. Wodeham holds that, according to Ockham's theory, it would be possible for a supernaturally conserved intuition to produce *false*, evident judgements of *non*existence. This, however, is the exact opposite of what Ockham's *N*-predicate dictates.

In order to expose this absurdity, Wodeham puts forward the following thought experiment. Imagine that a certain object, which naturally produces a certain intuitive cognition, is gradually removed from the perceiver. At some point the object ceases to affect the perceiver's mind, and thus to conserve into being the intuitive cognition.[36] Imagine now that, immediately thereafter, God substitutes the object's causal powers with his own absolute power, in order to seamlessly conserve the intuitive cognition. As a result, the cognition will produce a new perceptual judgement, this time of *non*existence. For while the cognition was previously acting in tandem with its object to produce a judgement of existence, it is now acting alone, provided that the object is no longer capable of interacting with it. But the resulting judgement of *non*existence will now be *false* because the object still exists, though is incapable of any causal interaction with its intuitive cognition. And this outcome is evidently inconsistent with Ockham's theory of *ICNE*.[37]

Wodeham concludes by firmly rejecting the possibility of any sort of immediate apprehension of the nonexistence of things: "…never by virtue of an intuitive cognition of an object can it be judged that the object of that cognition does *not* exist".[38]

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[35] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 4, ed. Wood et al, 39.29-32.

[36] For Wodeham's rejection of the possibility of action at a distance, see Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 2, ed.Wood et al., 39-40.34-37. For Ockham's rejection, see Guillelmus de Ockham, *Reportatio,* II, ed. Gál et al., 37.6-7; *Reportatio,* III, q. 2, ed. F. E. Kelley et G. I. Etzkorn (Opera theologica 6), St. Bonaventure, N.Y. 1982, 8-9; *Expositio in libros Physicorum Aristotelis*, VII, q. 6, § 7, ed. R. Wood, R. Green et al. (Opera philosophica 5), St. Bonaventure, N.Y. 1985, 43-44.

[37] For an alternate reconstruction of Wodeham's second argument, see Langridge, *"Nisi Deus Decipiat"*, 167.

[38] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 4, ed. Wood et al., 40.52-53:

The examination of Ockham's theory of *ICNE* has enabled Wodeham to unveil an intimate relation which exists between God's absolute power and the limits of human cognition.

> Nisi enim virtute notitiae intuitivae posset haberi certum iudicium de exsistentia rei quando exsisteret et de non-exsistentia quando non exsisteret, contradictio esset quod Deus certificaret nos de veritate contingenti. Probatio consequentiae: quia sicut Deus potest conservare visionem sine exsistentia obiecti ita potest conservare quamcumque aliam notitiam in mente, sive incomplexam sive complexam, sine exsistentia eiusdem. Igitur per nullam notitiam in mente potest nos certificare.[39]

The claim that "God cannot certify us of any cognition in our mind" means that not even God's absolute power can immediately produce in us intuitive cognitions which, in and of themselves, are invariably conducive to true, evident judgments of nonexistence. For by granting that God alone is able to immediately produce in our minds both noncomplex (intuitive and abstractive) and complex (propositional) cognitions, Wodeham bites the bullet and allows for the possibility of divine tampering at *any* stage of the perceptual process, as the thought experiment discussed above illustrates. Once we recognise that the human perceptual process is intrinsically vulnerable to God's causal intervention, we must reject the claim that *N*-type cognitions are veridical perceptual experiences. Wodeham thus realises the existence of an intimate relation between (*a*) our knowing that a certain entity exists and (*b*) our knowing that we are *not* being deceived by God when we know (*a*).

Interestingly enough, Ockham himself may have contributed to shaping Wodeham's opinion on this matter. In one of his earlier works, he actually expresses as much:

> … ad hoc quod sciam evidenter quod haec cognitio quam video intuitive sit ab hoc singulari, oportet quod *sciam … quod ista cognitio intuitiva non sit a Deo sicut a causa totali*.[40]

In assessing Ockham's theory of perception, and hence in shaping his own, Wodeham duly exploits this crucial realisation. For if one can

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"…numquam virtute notitiae intuitivae obiecti alicuius potest iudicari obiectum illius notitiae *non* exsistere" (my italics).

[39] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 5, ed. Wood et al., 41.20-26.

[40] Guillelmus de Ockham, *Reportatio,* II, q. 16, ed. Gál et al., 379.11-15 (my italics).

never completely discard the possibility, however slight, of God's tampering with natural causation in a perceptual process, then Ockham's epistemic optimism, as expressed in the *N*-predicate of his *CPD*, seems untenable in the last analysis.

It is therefore clear to Wodeham that an overarching theory of perception must take into consideration the possibility of God's tampering with natural causation. So regardless of whether an intuitive cognition is naturally produced by its object, or whether it is supernaturally produced by God alone, Wodeham holds that there can be *no absolute certainty* as to the truth of the resulting perceptual judgement:

> … nulla est notitia intuitiva cuius virtute evidenter iudicari possit res exsistere *nisi* supposito quod Deus *non* manuteneat notitiam intuitivam sine obiecto a quo naturaliter dependet.[41]

Finally, as can be recalled, Ockham had distinguished between *E*-type and *N*-type intuitive cognitions on account of their relational *disposition* to produce affirmative and negative existential perceptual judgements, respectively. This was a natural consequence of his rejection of Scotus' object-dependent criterion of distinction between intuitive and abstractive cognitions, and thus of his own endorsement of the power-dependent criterion. Wodeham goes one step further. He contends that the distinction between the two types of intuitive cognitions is more than merely dispositional. For, as we will discuss in the next section, there is *no common ground* to them.

IV. Wodeham's Disjunctivism

Wodeham's reformulation of Ockham's definition of intuitive cognitions occurs at two different levels – material and formal. The first level is concerned with the meaning of the two predicates in the definition, *E* and *N*, and in particular with their epistemic implications. To that end, we must recognise Wodeham's theological fallibilism – the view

[41] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 41.9-11, ed. Wood et al., (my italics). This is a rather obscure passage which evidently caused some confusion to editors of the *Lectura secunda*, as the critical apparatus of the edition attests. However, upon carefully examining the sole existing manuscript (Cambridge, Gonville and Caius, ms. 281/674), I am confident of the proposed reading. (I am thankful to Prof. Rega Wood, one of the editors of the *Lectura secunda*, for her valuable and kind help in providing me a copy of the microfilm of the manuscript.)

that we can never fully rule out supernatural tampering with the mechanisms of our perceptual experience – in all of its significance. However, we must fully acknowledge as well his *natural* fallibilism – the view that under natural conditions there can always occur perceptual episodes whereby the perceivers, unbeknownst to them, can form and assent to *false but evident* perceptual judgements.[42] With this in mind, let us formulate Wodeham's *E**-predicate as follows:

> (*E**) is naturally and normally capable of producing true, evident perceptual judgements of existence, if the thing exists.

Evidently, Wodeham's *E**-predicate differs from Ockham's *E-predicate* in that it includes the modal adverbs "naturally" and "normally". These adverbs express two conditions which any *veridical* perceptual experience must comply with, namely that

> 1. God has not tampered with natural causation during the perceptual process; and that
>
> 2. adequate perceptual circumstances (no sickness in the perceiver, no perceptual obstacles, etc.) hold.

Only if both conditions are obtained, the intuition is invariably conducive to true, evident perceptual judgements.

This brings us to Wodeham's reformulation of Ockham's *N-predicate*. For if either condition fails to be obtained, the intuition is by stipulation a *delusive* perceptual experience, in the sense that it is invariably conducive to false, evident perceptual judgements. However, this is not because there is no perceptual awareness of an individual entity, as Scotus' theory dictates. In Wodeham's theory, as well as in Ockham's, there *is* such an awareness, regardless of whether the entity exists or not. In this case the intuition is simply powerless of yielding perceptual knowledge.

Now although Wodeham agrees with Ockham that the two types of intuitive cognition are *phenomenically* identical, he denies that they are *epistemically* identical as well. He thereby subsumes under the *N**-predicate of his definition all *supernaturally* produced intuitive cognitions which are conducive to perceptual delusions.

In addition, he also subsumes under the *N**-predicate all *naturally* produced intuitive cognitions which happen to be conducive to per-

[42] See below.

ceptual delusions, that is, all natural intuitions which bring about false, evident perceptual judgments, due to "abnormal" circumstances (sickness, the presence of opaque intervening obstacles, etc.). Of course, as with supernatural delusive intuitions, natural delusive intuitions can*not* be detected to be such by introspective reflection.

> Let us accordingly formulate Wodeham's *N**-predicate as follows:
>
> (*N**) is capable of producing *false*, evident perceptual judgements of existence, if the thing does *not* exist; or of *non*existence, if the thing does exist.

Note that the modal adverbs have been removed in order to convey that *N**-type cognitions can only be obtained under supernatural or abnormal circumstances.

Let us conclude our review of Wodeham's first, material level of amendment by remarking that in it there is absolutely no reference to the supernatural or natural *origin* of the intuitive cognitions. This is because Wodeham does not chart the distinction between *E**-type and *N**-type intuitive cognitions in terms of their causes, as Ockham did, but in terms of their *effects*. And these can only be perceptual knowledge, in the former case, or perceptual delusion, in the latter.

The second, *formal* level of reformulation concerns the logical relation which is obtained between the two types of intuitions, as formally expressed in their definition. As we have discussed, Ockham took both natural *and* supernatural intuitive cognitions to be invariably veridical. He thereby conceived of the whole species of perceptions as essentially homogeneous or "conjunctive". This accounts for the logical form of his definition, in which the two different predicates are *jointly* verified of one single species of mental acts. Ockham's *CPD* thus ultimately expresses a relation of logical agreement or *compatibility* between the two types of intuitions.

Unlike Ockham's account, Wodeham's analysis of human perceptual experience, conveyed by the first, material level of reformulation, clearly suggest the opposite view. It is Wodeham's strong conviction that there are relevant *epistemic* differences between *E**-type and *N**-type intuitions which set them essentially apart. The logical form of Wodeham's definition must duly express the relation of logical incompatibility which arises between them. Such is precisely the thrust of the following remarkable passage:

> Et forte ex hoc primo ortum habuit illud dictum quod "intuitiva est virtute cuius scitur res exsistere quando exsistit et non exsistere quando non exsistit'. Non prout ista est *de copulato praedicato*, sed ut est *copulativa*. Quia tunc non denotatur quod eadem intuitiva sit talis et talis sicut in primo sensu, sed quod aliqua sit talis et aliqua talis.[43]

Wodeham is clearly seeking to understand Ockham's motivation for his theory of *ICNE*. Although Wodeham categorically denies any possibility of immediate awareness of an entity's nonexistence, he nonetheless contemplates some cases where the perception of the existence of an entity can reasonably enable one to *infer* the nonexistence of another entity.[44] The first case – which Wodeham alludes to at the beginning of this passage – concerns the sight of Socrates' cold, livid body, where Socrates' nonexistence can be reasonably inferred. Wodeham speculates that the consideration of such cases of inferential (or discursive) cognition of nonexistence could have motivated Ockham to formulate his *CPD*, and particularly his *N-predicate*.

He continues by explaining that Ockham's definition of intuitive cognitions – which he summarily quotes – is *intrinsically ambiguous*, and that it can thus be taken in two different, incompatible senses. The *first* sense of the definition, which he formally characterises as being "of conjunctive predicate" (*de copulato praedicato*), expresses that "the same intuitive [cognition] is such-and-such" (*eadem intuitiva sit talis et talis*). The emphasis is placed here on the term "same" (*eadem*), which is used to express sameness of *kind*. Accordingly, the first sense means that (*i*) an intuition which can bring about true, evident judgements of existence (if its object exists) is of the same kind (*eadem*) as (*ii*) an intuition which can bring about true, evident judgements of nonexistence (if it does not exist). And this is tantamount to saying that both the *E*- and *N*-predicates are verified of the same kind of mental act.

But this is precisely what Wodeham denies. For one thing, his thought experiment is intended to show that there can exist supernaturally produced intuitions conducive to perceptual deceit. For another, his account of perceptual illusions explains how some naturally produced intuitions are also conducive to deceit.[45] Lastly, it is conceivable

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[43] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 4, ed. Wood et al., 39.10-14 (my italics).

[44] Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 4, ed. Wood et al., 38-39.6-11.

[45] For Wodeham's theory of sensory illusions, see Adam de Wodeham, *Lectura se-*

that some supernatural intuitions could yield as well perceptual knowledge. For example, God could immediately produce in someone's mind an intuitive cognition of a certain spiritual entity, while also producing the corresponding true, evident perceptual judgement (by acting himself in tandem with the intuitive cognition). In this logically possible scenario, the supernaturally produced intuition is clearly *veridical*, as it is invariably productive of a true, evident perceptual judgement of existence.[46]

These considerations lead to the following negative conclusion. Ockham's *E*- and *N*-predicates, when reformulated as Wodeham's *E**- and *N**-predicates, do *not* define an essentially homogeneous class of noncomplex acts of awareness. Put otherwise, there is *no* kind of mental act which Wodeham's predicates can *jointly* be verified of.[47] And this is the reason why Wodeham rejects the first sense of the Ockham's definition.

The second sense, on the other hand, which he describes as "conjunctive" (*copulativa*), expresses instead that "one [cognition] is such and the other [cognition] is such" (*aliqua sit talis et aliqua talis*). The emphasis is placed here on the correlation "one-the other" (*aliqua–aliqua*), which serves to convey specific diversity. Accordingly, what the second sense expresses is that an intuitive cognition which can produce perceptual knowledge is *not of the same kind* as an intuitive cognition which can produce perceptual delusion. And this entails that the whole species of intuitive cognition is actually composed of two different, nonoverlapping kinds of mental act of noncomplex apprehension. Let us accordingly propose the following schema for Wodeham's *conjunctive* definition:

(*CD*) (*I* is *E**) and (*I* is *N**).

While Ockham's *CPD* and Wodeham's *CD* may appear to be equivalent at first glance, this is not really the case. The reason is that not only *E* and *E** are materially diverse, but also that *N* and *N** are mate-

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cunda, Prol., q. 3, ed. Wood et al., 64-83. See also Wood, "Adam Wodeham on Sensory Illusions"; Langridge, *"Nisi Deus Decipiat"*.

[46] Take, among other possible narratives, the well-known case of the "doubting Thomas," to whom Jesus appears after his resurrection (*Jn*., 20, 24-29).

[47] See Adam de Wodeham, *Lectura secunda*, Prol., q. 2, § 4, ed. Wood et al., 39.15-17, as well as n. above.

rially incompatible to one another. And this entails that Ockham's and Wodeham's definitions are formally incompatible.[48] This recognition is crucial for us, as it elucidates the substantive difference between Ockham's and Wodeham's positions.

Now according to medieval terminist logic, a *conjunctive* proposition whose subject terms are the same (i.e. have the same *significatio* and *connotatio*), but whose predicate terms are not the same, is equivalent to a *disjunctive-predicate* proposition, the disjunction being inclusive.[49] In addition, if the predicate terms are materially incompatible as well, that is, if they cannot be verified of the same subject at the same time, then the disjunction is exclusive.[50] To take an example of Ockham's,[51] consider the conjunctive proposition, "I now sell pepper in Rome *and* I now sell pepper in London." Evidently, its two predicate terms are not only materially diverse, but also materially incompatible to one another. According to Ockham, this copulative proposition is equivalent to the disjunctive-predicate proposition, "I now sell pepper *either* in Rome *or* in London."

It hence follows that Wodeham's original *CD* it is equivalent to the following *disjunctive-predicate* definition:

(*DPD*) *I* is (either *E** or *N**).

Its purpose is to uniquely identify a *disjunctive* class, that of perceptual experiences, as exhaustively composed of veridical (*E**-type) and nonveridical (or delusory) (*N**-type) noncomplex acts of awareness. What makes these two types belong to a genuine class is precisely the very thing that sets them apart from the class of abstractive cognitions – their power to bring about the formation of, and assent to, perceptual judgements.

As we discussed, in addition to this power-dependent difference, Wodeham holds that intuitive and abstractive cognitions also differ

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[48] And even if they were materially compatible, conjunctive and conjunctive-predicate propositions are not necessarily convertible, as medieval logicians explained. See e.g., Guillelmus de Ockham, *Summa logicae*, I, q. 66, ed.Boehner et al., 205.147-153.

[49] Schematically, "(*S* is *P*) and (*S* is *P**)" is equivalent to "*S* is (*P* and/or *P**)".

[50] Schematically, "(*S* is *P*) and (*S* is *P**)" is equivalent to "*S* is (either *P* or *P**)".

[51] Or rather, "I *either* now sell pepper in Rome *or* now sell pepper in London," which entails the latter.

with respect to their causes. Even so, he contends that the *origin* of an intuitive cognition cannot determine its phenomenical, psychological, or epistemological features. The dichotomous distinction between *E**-type and *N**-type intuitions is not mapped, and cannot be mapped, onto the distinction between natural and supernatural cognitions. And this ultimately constitutes a significant difference in the ways Wodeham and Ockham seek to charter the varieties of perceptual experience.

Let us conclude this section by summing up Wodeham's account of that distinction:

> 1. Phenomenically, *E**-type and *N**-type cognitions are both the *same type of conscious manifestation*, as they are necessarily indistinguishable from one another under introspective reflection.
>
> 2. Psychologically, each type of intuitive cognition belongs to a *different kind of mental act*, which, in Wodeham's view, amounts to saying that they belong to different kinds of mental qualities inhering in the perceiver's mind.
>
> 3. Epistemically, they are capable of producing essentially *different kinds of perceptual experience*. *E**-type cognitions invariably produce true, evident perceptual judgements, while *N**-type cognitions invariably produce false, evident perceptual judgements. Accordingly, the former are *veridical* perceptual experiences, while the latter are *delusive* perceptual experiences.

V. Conclusion

Whereas Ockham had conceived of natural sensory illusions (and perhaps even supernatural ones, in the case of miracles) as subpar intuitive cognitions, and thus had excluded them from his theory of perception; Wodeham, by contrast, decided to systematically account for them in his own theory. This means that, for him, supernaturally and naturally produced acts of noncomplex apprehension which are invariably conducive to perceptual delusions (i.e., qualitative illusions or substantial hallucinations) are nonetheless genuine intuitive cognitions.

The cleavage between Ockham's and Wodeham's theories is ultimately expressed in the logical *form* of their respective definitions of intuitive cognitions. Ockham's *CPD* identifies all intuitions as belonging to an essentially homogeneous class. The only difference between intuitions falling under the *E-predicate* and those falling under the *N-predicate*, concerns their origin – natural or supernatural. But

their phenomenological and epistemic characteristics makes them fall under the same kind of mental acts. By contrast, Wodeham's *DPD* expresses a genuine disjunction between two types of intuitive cognition, that is, between two varieties of perceptual experience. These types are not distinguished by the cognitions' origin, but rather by their effects. Intuitions falling under the *E**-predicate invariably produce perceptual knowledge, while those falling under the *N**-predicate invariably produce perceptual delusion. And this entails that they are not the same kind of mental act, even if they are phenomenically identical.

Universidad de los Andes, Bogotá D.C.

Metaphor as a Source of Visualization of Cognitive Process in Meister Eckhart's Metaphysics: The Example of Predigt 9

Tamar Tsopurashvili

In German Sermon 9[1] Meister Eckhart "translates" an essence of his theory of intellect into visual images of metaphorical language, making the metaphor the main source of expression. Metaphor becomes the main element in the process of thinking in images and through images ("Denken in Bildern und durch Bilder")[2] building core characteristics of his strategies of exegesis. This way of thinking in images and through images makes an "iconic," "pictoral," and "visualistic turn" in Eckhart's thought.[3] This "translation" from speculative Latin concepts into metaphorical German Language[4] becomes possible with his theory of predication that is found in a very brief form also in the *Predigt* 9.

[1] The title of the sermon according to the critical edition is as follows: *Predigt* 9. "*Quasi stella matutina in medio nebulae et quasi luna plena in diebus suis lucet et quasi sol refulgens, sic iste refulsit in templo dei"*. Henceforth, I will refer it as *Predigt* 9.

[2] J. Casteigt, "Denken in Bildern und durch Bilder: Eckharts Einssein im Anderen", in *Divus Thomas* 122,2 (2019), 265-295.

[3] The focus of Eckhart-research was evolved to the "iconic turn" by D. Mieth in his monograph *Meister Eckhart*, München 2014, 13-16. About "iconic turn" in Meister Eckhart see the recent scholarship: M. Vinzent, "Eckharts Bildersprache in den lateinischen Predigten", in *Sprachbilder und Bildersprache bei Meister Eckhart und in seiner Zeit*, hrsg. v. C. Dietl und D. Mieth (Meister-Eckhart-Jahrbuch 9), Stuttgart 2015, 1-26; S. Grotz, "Wie zerbricht man Gleichnisse? Anmerkungen zur Struktur von Meister Eckharts Bildersprache", in Dietl und Mieth, *Sprachbilder und Bildersprache*, 71-86; M. Nientied, "Meister Eckhart und die unendliche Kugel. Zu Funktion und Einsatz einer Sprengemetapher", in Id., 119-136. On the use of corporal metaphors in the works of Meister Eckhart see also A. Beccarisi, "Über Körperlichkeit und Erkenntnis", in *Meister Eckharts Werk und seine Wirkung: Die Anfänge*, hrsg. v. F. Löser, H.-J. Schiewer und R. D. Schiewer (Meister-Eckhart-Jahrbuch 11), Stuttgart 2017, 319-336.

[4] M. Vinzent, "Meister Eckhart's Self-Translation into the Vernacular", in *Bulletin de philosophie médiévale* 59 (2017), 109-134.

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In order to indicate Eckhart's understanding of semantical entities and their relevance to his metaphysics, we need to first discuss his theory of predication and the ontologization of semantics, as well the theoretical consequences following from it that build an important premise for the discourse developed in his writings.

Eckhart's Understanding of Semantical Entities and its Impact on his Metaphysics

In the Middle Ages Aristotle's *Peri Hermeneias* (Περὶ Ἑρμηνείας) and its Boethian interpretation was an inspiration for reflections on semantical entities. Meister Eckhart is not exceptional in this regard. Eckhart discusses this very tentative subject in his speculative project *Opus tripartitum*, especially in *Expositio libri Exodi* n. 55, where he refers to and comments on the first passage of *Peri Hermeneias* (Περὶ Ἑρμηνείας) (I 1, 16a 3-4).[5] Based on this commentary we can assume that Eckhart considers names or propositions to signify primarily concepts, *passiones animae*, rather than things. Therefore, he claims that the truth or falsity of propositions depends on the concepts which they primarily signify, i.e., which are in the intellect, and not on extramental things. So, the *locus* of concepts is in the intellect. The concepts located in the intellect reveal for Eckhart the function of the names as such. He thinks that this function is already manifested in the etymology of the words "*nomen*" and "*notitia*": "name" (*nomen*) comes from "knowledge" (*notitia*).[6] Hence a name is a fragment of knowledge, that is as a concept in intellect and making it possible to share this knowledge

[5] Meister Eckhart, *Expositio libri Exodi,* n. 55, LW (=*Die lateinischen Werke,* hrsg. v. E. Benz, K. Christ, B. Decker, B. Geyer, J. Koch, H. Fischer, E. Seeberg, L. Sturlese und A. Zimmerman, Stuttgart 1936-) II, 60.6-9: "Secundo praenotandum est quod orationes sive propositiones respondent primo et per se non rebus, sed rerum conceptionibus. Sunt enim voces signa et 'notae earum quae sunt in anima passionum'. Propter quod ipsam conceptionem notant et indicant et significant. Et idcirco etiam iudicantur esse verae vel falsae, compactae vel incompactae orationes sive propositiones non ex rebus sive ex entibus absolute, sed ex rerum et entium conceptionibus, quas significant primo et per se."

[6] Meister Eckhart, *Expositio libri Exodi*, n. 167, 146.17-147.3: "[...] nomen autem a notitia dictum est, eo quod sit nota conceptus alicuius in intellectu, notificans etiam ipsum conceptum aliis. Propter quod ipsum est nuntius, quo nuntiatur ipse conceptus aliis."

with others. He harmonizes these considerations with the presumption claiming that the names signify the *rationes*: the *ratio* has an intellectual origin and nature; it belongs to the intellect and to the truth, which is only in the intellect and not in the world of extramental beings.[7] Thus, it maintains the possibility of having the true knowledge about essences and not about empirical things. In *Expositio sancti Evangelii secundum Iohannem* Eckhart repeats this idea even more explicitly: the *ratio* is formed through understanding. Moreover, as Eckhart writes, the *ratio* subsists simultaneously with the intellect, since it is the intellectual understanding and the intellect itself.[8]

Based on these Eckhartian considerations we can agree with Alessandro Palazzo that Eckhart's metaphysics represents "a peculiar form of realism that diverges from major positions in the late thirteenth-century and early fourteenth-century debate on whether common names signify primarily concepts or extramental things."[9] Here it is worth nothing that the proper source of Eckhart's realism builds the Platonic-Augustinian tradition.[10]

These referred passages from Exodus' Commentary and John's Commentary allow us to assume that Eckhart considers the concepts as standing for intelligible quiddities, i.e., divine ideas of creatures. Hence, *rationes* belong to the *esse virtuale* – they retain superior ontological condition in comparison to extramental things and their mode of existence.[11] But this reflection leads us to the question: How do *ra-*

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[7] Meister Eckhart, *Expositio libri Exodi*, n. 176, LW II, 152.1-2: "[…] ratio id quod est ad intellectum pertinet et ad veritatem. Veritas enim in solo intellectu est, non extra."

[8] Meister Eckhart, *Expositio sancti Evangelii secundum Iohannem*, n. 38, LW III, 33.2-4: "Iterum et ratio in intellectu est, intelligendo formatur, nihil praeter intelligere est. Iterum etiam coaeva est intellectui, cum sit ipsum intelligere et ipse intellectus."

[9] A. Palazzo, "Eckhart on Signification", in *Bulletin de philosophie médiévale* 61 (2019), 110.

[10] Cf. W. Achtner, "Eckharts Bildkritik – vom Bild zur Bildlosigkeit. Erkenntnistheoretische, psychologische und theologische Aspekte", in *Sprachbilder und Bildersprache bei Meister Eckhart und in seiner Zeit*, 87-118, 97.

[11] Palazzo, "Eckhart on Signification", 110. Regarding the discussion about logic and semantic in the Middle Ages see also J. Pinborg, "Bezeichnung in der Logik des XIII. Jahrhunderts", in *Der Begriff der Repraesentatio im Mittelalter. Stellvertretung, Symbol, Zeichen, Bild,* hrsg. v. A. Zimmermann (Miscellanea Mediaevalia 8), Berlin-New York 1971, 238-281; L. M. de Rijk, "Die Wirkung der neuplatonischen

tiones relate to *intelligere*? Based on *Expositio in sancti Evangelii secundum Iohannem* n. 38 it can be concluded that, for Meister Eckhart, *intelligere* culminates in gaining the *rationes*. Moreover, according to Eckhart, the concepts in the intellect signified by names are identical with *rationes,* i.e., with the essence of the things perceived through reason.

Therefore, Meister Eckhart gives an exact theorization of the relation between language, cognition and reality, making the understanding, defining and naming to the parallel actions: they relate to the same object – to the essences, *rationes*, common natures, – identical with the ideas in God's mind.[12] So, by commenting on Aristotle, Eckhart truly demonstrates himself as a Neoplatonic thinker.

It is characteristic for Meister Eckhart's semantics the distinction between *termini generales* and other terms. In order to differentiate them, Eckhart uses the Aristotelian considerations in *Peri Hermeneias* (Περὶ Ἑρμηνείας) 16a[13] and their Boethian interpretation as his main sources. He therefore builds his theory on Boethius' semantical considerations very intensively.

Boethius interprets Aristotle's passage as follows: the "word" represents the spoken verbal sign, the "concept" means the content of the word, and the "thing" indicates the object that is designated by the concept itself. The thing is signified by the noun, since it is determined for this thing (*positione significanti*). Hence, according to Boethius' understanding, nouns represent the signs of mental contents (*animae passionum notae*), while the concept of "mental content" is for him equivalent with "*intellectus*," "*imagines*" and "*similitudines rerum*."[14]

Semantik auf das mittelalterliche Denken", in *Sprache und Erkenntnis im Mittelalter*, hrsg. v. A. Zimmermann (Miscellanea Mediaevalia 13,1), Berlin-New York 1981, 19-35.

[12] Palazzo, "Eckhart on Signification", 110.

[13] Aristoteles, *De Interpretatione* 16a, ed. A. F. Didot (Opera Omnia 1), Paris 1854, 24-38, 24: "Sunt vero voce emissa passionum animae signa, et scripta, eorum quae voce emittuntur. Et quemadmodum nec literae omnibus eaedem sunt, ita nec voces omnibus eaedem: quorum tamen haec signa primo sunt, ea omnibus sunt eaedem passiones animae; et quorum haec imagines sunt, ea quoque omnibus sunt res eaedem."

[14] Boethius, *Commentarii in librum Aristotelis Peri Hermeneias*, ed. C. Meiser, Pars prior, Lipsiae 1877, 33.1.30.

Following Boethius, Meister Eckhart outlines in his account the connotative aspects of *termini* used in the proposition. He claims that the connotation of *termini* varies according to the type of language operation: we should differentiate the language we use for *termini generales* in their full meaning (i.e. when they refer to God) from the language that we use for creatures ("*aliter sentiendum est de ente et aliter de ente hoc et hoc*").[15] Eckhart's statement leads us to claim that his thoughts resonate with the *modi significandi*-discussion: his reflection switches to the *modi significandi*-discussion, that was considered part of the speculative grammar.[16] While the grammatical passages in Eckhart's work are not always explicitly evident, it is obvious that his comment on *Peri Hermeneias* (Περὶ Ἑρμηνείας) in *Expostio libri Exodi* n. 55 represents a *topos*, where he clearly discusses grammatical issues. It should be mentioned that an echo of these reflections is found also in *Predigt* 9. Moreover, Eckhart's considerations about *modi significandi* build a premise for his various metaphysical theses. The modistic influences on Meister Eckhart lead to the ontologization of semantics[17] – a

[15] Meister Eckhart, *Prologus in Opus propositionum,* n. 3, LW I, 166.12-167.8. The full passage of quotation: " […] aliter sentiendum est de ente et aliter de ente hoc et hoc. Similiter autem de esse absolute et simpliciter nullo addito, et aliter de esse huius et huius. Similiter etiam de aliis, puta de bono absolute et aliter de bono hoc et hoc aut de bono huius et bono huic. Cum igitur dico aliquid esse, aut unum, verum seu bonum praedico, et in praedicato cadunt tamquam secundum adiacens praemissa quattuor et formaliter accipiuntur et substantive. Cum vero dico aliquid esse hoc, puta lapidem, et esse unum lapidem, verum lapidem aut bonum hoc, scilicet lapidem, praemissa quattuor accipiuntur ut tertium adiacens propositionis nec sunt praedicata, sed copula vel adiacens praedicati." On this matter see K. Albert, Meister Eckharts These vom Sein. Untersuchungen zur *Metaphysik des Opus tripartitum*, Saarbrücken-Kastellaun 1976 and A. Beccarisi, "L'ente determinato secondo Meister Eckhart", in *Nel labirinto della materia*, a cura di C. Altini, Roma 2021, 55-77.

[16] Susanne Köbele examines the reminiscence of speculative grammar in Eckhart's works as an "absolute" grammar. S. Köbele, "Bîwort sîn. 'Absolute' Grammatik bei Meister Eckhart", in *Zeitschrift für deutsche Philologie* 113 (1994), 190-206; Claire Taylor Jones outlines that for identifying Eckhart's concrete connection to Modistic thought: "[…] one must identify the places in Eckhart's writing where he either addresses the issues that were important to the *Modistae* or uses the Modistic interest in what we would call ontology and epistemology." C. Taylor Jones, "The Trouble with Verbs: Meister Eckhart and the Tropology of Modistic Grammar", in *Mystics Quarterly* 35,3-4 (2009), 99-126, 103.

[17] For ontologization of semantics see J. Pinborg, *Logik und Semantik im Mittelalter. Ein Überblick* (Problemata 10), Stuttgart 1972.

very characteristic manoeuvre in his thought that transforms the metaphysical discussion into issues relevant to grammatical theory.

Ontologization of Semantics

Meister Eckhart considers the predication as a certain mixture in itself: on the one hand it expresses an essence-predication, on the other hand it presumes an existence. For him this kind of synthesis between an essence-predication and existence is particularly emphasized with respect to denotation. In *Expostio libri Exodi* n. 84 we find the evident echo of Modistae in Eckhart's reflections. Here he discusses the three modes of signification: mode of being, mode of expression and mode of intelligizing, as well their correlation. The main idea of this inquiry claims that *modi significandi* and *modi praedicandi* are directed according to the *modi intelligendi*.[18] Eckhart assumes that a concrete word designates only the form, for instance "white means only the quality". And here is Eckhart's decisive idea: whereas the predicate does not signify the subject directly ("*licet subiectum non significet*"), it still co-signifies and connotates its meaning ("*consignificat et connotat*"). Eckhart assumes that the subject always refers to the form as a passive one to an active one ("*passivum ad activum*"), like the effect to the cause ("*effectus ad causam*").[19]

Therefore, the semantic reflections, and particularly the modistic one, build the foundation for a proper understanding of Eckart's metaphysical theses that are expressed as definitions and are built according to the following structure: S *est* P. According to his account, in the sentences formulated as definitions, the meaning expressed by the predicate cannot be separated from the meaning of the subject, since, as Eckhart claimed it already in Exodus' Commentary n. 84, the pred-

[18] About the difference between *significatio* and *praedicatio* in Meister Eckhart see M. P. Schirpenbach, *Wirklichkeit als Beziehung. Das strukturontologische Schema der Termini generales im Opus Tripartitum Meister Eckharts* (Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters 66), Münster 2004, 50.

[19] Meister Eckhart, *Expositio libri Exodi,* n. 84, 87.11-14: "Unde secundum modum intelligendi accipiuntur et formantur modi significandi et consequenter modi praedicandi […] Concretum autem significat formam solam, sicut ‚album solam qualitatem'. Sed licet subiectum non significet, tamen consignificat et connotat. Subiectum vero semper se habet respectu formae sicut passivum ad activum et effectus ad causam."

icate does not signify the subject directly, but it still co-signifies and connotes it. This Eckhartian perception of definition correlates with the understanding of definition declared by Dietrich of Freiberg in his treatise *De accidentibus*. As Dietrich writes, according to the general understanding the definition as the whole sentence and the subject of definition, the defined one, cannot be separated from each other, because both of them express essentially the same.[20]

Hence, what Eckhart describes with the term *'consignificare'* in the formulation "*licet subiectum non significet*," but "*consignificat et connotat*," Dietrich perceives as an essential sameness of the whole definition and of the subject.[21] Here again it becomes evident that Eckhart's semantical analysis is founded on *modi significandi*-theory: he uses this theory to differentiate propositional contexts that determine the meaning of the words in the sentence. These different propositional contexts are based on the semantical aspects of the terms and identify the understanding of the models of predication in general: the signification of words becomes determining when we have to deal with the understanding of the sentences that express the metaphysical entities. As demonstrated above, *Prologus in Opus propositionum* n. 3 represents Eckhart's statement, where metaphysics meets semantics in his thought: "*Aliter sentiendum est de ente*" and "*aliter de ente hoc et hoc*."[22] It should be noted that this idea is so decisive for him that he also repeats it with a different formulation in the *Prologus generalis in opus tripartitum.* In both cases he places this thesis in the prologues of his works as guidance for reading the definitions referring to the metaphysical-theological content in his doctrine. In *Prologus generalis* he writes that we cannot perceive *termini generales,* main terms (i.e., be-

[20] Dietrich de Freiberg, *Tractatus de accidentibus*, ed. M. R. Pagnoni-Sturlese (Opera omnia 3), Hamburg 1983, 82.63-65: "Convenit autem hoc universaliter definitioni et definito, ut ab invicem separari non possint, cum in utroque istorum importetur unum et idem per essentiam."

[21] About Dietrich's understanding of definition see T. Tsopurashvili, "Wie lässt sich das Seiende durch die Sprache beschreiben? Eine Reflexion über Dietrich von Freibergs Sprachtheorie", in *Homo – Natura – Mundus: Human Beings and Their Relationships. Proceedings of the XIV International Congress of the Société Internationale pour l'Étude de la Philosophie Médiévale,* ed. R. Hofmeister Pich, A. C. Storck, A. S. Culleton (Rencontres de philosophie médiévale 23), Turnhout 2020, 489-498.

[22] Meister Eckhart, *Prologus in Opus Propositionum*, n. 3, LW I, 166.13-167.8.

ing, unity, truth, wisdom, goodness etc.), like the nature of accidents.[23] Eckhart starts his declamation with the common Aristotelian thesis that accidents gain their being in the substance and through the substance. Hence, they receive their being in something else. But in the case of *termini generales* it happens in an absolutely different way, because they are convertible with being as such. For this conclusion there is the premise that the being per se, and everything convertible with it, is not subsumed in the thing as secondary, but is prior to everything in it.[24]

Consequently, according to Eckhart, the discursive difference regarding the expressions about *ens* and *ens hoc et hoc*, which has its roots in the Negative Theology, is combined with the *modi significandi*-theory. Thus, it is transformed into a new cognitive strategy in order to understand the semantical entities. In *Expositio libri Exodi* n. 65 we find the formulation explaining Eckhart's understanding of predication: he claims that in God all accidental categories "*transeunt in substantiam*," and it happens "*secundum genus suum*" and "*modum praedicandi*."[25] This leads to the assumption for Eckhart that the accidental qualities referring to God describe nothing accidental any more, instead they identify the essence of God, as they are transformed ("*transeunt*") into substance, expressed in the sentence with the grammatical subject. This dynamic of the transformation of accidental qualities into the essential one becomes possible through the transformation in their signification modus: that what expresses something accidental referring to the *ens hoc et hoc* indicates only the essence with respect to God. For Eckhart it assumes that in the sentence with the structure 'S *est* P', when it refers to metaphysical entities, the accidental quality expressed with the predicate, based on its *modus significandi*, is necessarily transformed ("*transeunt*") into the inherent content of the subject and hence builds a

[23] Meister Eckhart, *Prologus generalis in Opus tripartitum*, n. 8, LW I, 152.9-12: "[…] de terminis generalibus, puta esse, unitate, veritate, sapientia, bonitate et similibus nequaquam est imaginandum vel iudicandum secundum modum et naturam accidentium, quae accipiunt esse in subiecto et per subiectum et per ipsius transmutationem et sunt posteriora ipso et inhaerendo esse accipiunt."

[24] Meister Eckhart, *Prologus generalis*, n. 8, LW I, 152.15-153.2: "Non enim ipsum esse et quae cum ipso convertibiliter idem sunt, superveniunt rebus tamqaum posteriora, sed sunt priora omnibus in rebus."

[25] Meister Eckhart, *Expositio libri Exodi*, n. 65, LW II, 69.14-16: "Igitur omnia praedicamenta accidentalia in deo transeunt in substantiam secundum genus suum et modum praedicandi, quem sorti<un>tur a subiecto et ex habitudine ad subiectum."

part of its essence. This type of subject-predicate relation is declared in the medieval *inhaerentia*-theory that Meister Eckhart obviously shares in his account. [26] Accordingly, the definitions referring to God's essence should be read in Eckhart's works according to the medieval *inhaerentia*-theory. This is a very special aspect of Eckhart's understanding of predication forming the characteristics of his theological discourse.

This type of predication leads us to understand Eckhart's "pictorial turn" and his usage of metaphors as well.

Metaphor: The Example of Predigt 9

In *Predigt* 9 Eckhart refers to metaphors "*templo dei*" and "*Vorhof*." He emphasizes these visual images in order to describe the process of cognition and intelligizing. Let us examine how the semantical scheme demonstrated in the previous chapters is reflected in this attempt.

As a preliminary note it should be mentioned that the *Predigt* 9 is considered as a key sermon of the collection *Paradisus anime intelligentis* demonstrating the specific Dominican doctrine. It is dated back to the middle of the 14th century and contains Eckhart's non-heretical sermons. According to the convenient opinion among Meister Eckhart-researchers, it was Eckhart's subsequent defence (*Verteidigungsschrift*).[27]

In *Predigt* 9 Eckhart deals with the quotation from Ecclesiastes' book 50,6.[28], where the visual image of God's temple ("*templo dei*")

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[26] About the difference of medieval *inhaerentia*-theory and identity-theory: Pinborg, *Logik und Semantik im Mittelalter*, 53; About the relevance of this theory to Eckhart's semantics T. Tsopurashvili, *Sprache und Metaphysik. Prädikationslehre Meister Eckhart und ihre Auswirkung auf sein Denken* (Bochumer Studien zur Philosophie 52), Amsterdam-Philadelphia 2011.

[27] About the characteristics of this German Sermon see Köbele, "Bîwort sîn. 'Absolute' Grammatik bei Meister Eckhart", 196-197: "Bereits ihr Titel ist eine eindeutige Stellungnahme im Ordensstreit um die Frage nach der Priorität von *intellectus* oder *voluntas*/*caritas*. So liegt es für diese Predigt nahe, nicht nur die besondere Hervorhebung der *vernünfticheit*, sondern auch die oben angesprochenen Leerstellen und ‚Zwischenräume' mit einer dogmatisch bereinigenden Redaktion in Verbindung zu bringen."; also K. Flasch, "Predigt 9: 'Quasi stella matutina'", in *Lectura Eckhardi* IV, hrsg. v. G. Steer und L. Sturlese, Stuttgart 2017, 1-28.

[28] The *Predigt* exegesis follows a passage from Ecclesiastes (*Ecc.* 50, 6).: "*Quasi stella matutina in medio nebulae et quasi luna plena in diebus suis lucet et quasi sol refulgens, sic iste refulsit in templo dei*".

appears. In the exegesis of this passage Eckhart focuses on it. In order to analyse these words, he questions the essence, *quidditas* of God: "*Waz ist got*" and "*waz ist tempel gotes?*"[29] For this aim Eckhart recalls the *Book of 24 Philosophers* (*Liber vigintiquattuor philosophorum*), attributed to Pseudo-Hermes Trismegistus.[30] Based on this text he outlines three answers on this question:

According to the first answer, God is something in relation to which all temporal and alterable things are nothing, and everything that has being is minor in comparison to Him. Hence, according to the first answer, God is beingless.[31]

The second answer from the *Liber vigintiquattuor philosophorum* defines God in a negative way and describes Him as one that exists beyond the being, is necessarily over the being, is something that does not require anything in itself for its existence, but is rather required by all things to exist. Therefore, God is in all creatures, since they have being, and He is over them at the same time.[32] Given that He is in all

[29] Meister Eckhart, *Predigt* 9, DW (=*Die Deutschen Werke* hrsg. v. J. Quint und G. Steer, Stuttgart 1936-) I, 141-158, 141.6-7.

[30] For the critical edition see Hermes Trismegistus, *Liber vigintiquattuor philosophorum*, ed. F. Hurdy (Corpus Christianorum. Continuatio Mediaevalis 143), Turnhout 1997. Regarding the analysis of this text since the twentieth century see the following publications: C. Baeumker, "Das pseude-hermetische Buch der vierundzwanzig Meister (Liber XXIV philosophorum). Ein Beitrag zur Geschichte des Neuphytagoreismus und Neuplatonismus im Mittelalter", in *Studien und Charakteristiken zur Geschichte der Philosophie, insbesondere des Mittelalters. Gesammelte Aufsätze und Vorträge*, Münster i. W. 1927, 194-214; M.-Th. d'Alverny, "Un témoin muet des luttes doctrinales du XIIIe siècle", in *Archives d'histoire doctrinale et littéraire du moyen Âge* 17 (1949), 223-248; also K. Flasch, *Was ist Gott? Das Buch der 24 Philosophen*, München 2011. The meaning of the *Liber vigintiquattuor philosophorum,* especially for Meister Eckhart's metaphysics, was analyzed in A. Beccarisi, "'noch sint ez allez heidnischer meister wort, die niht enbekanten dan in einem natiurlîchen liehte': Eckhart e il *Liber vigintiquattuor philosophorum*", in *Studi sulle fonti di Meister Eckhar*t II, a cura di L. Sturlese (Dokimion 37), Fribourg 2012, 73-96.

[31] Meister Eckhart, *Predigt* 9, DW I, 142.3-5: "got ist etwaz, gegen dem alliu wandelbæriu und zîtlîchiu dinc niht ensint, und allez, daz wesen hât, daz ist vor im kleine."

[32] Meister Eckhart, *Predigt* 9, DW I, 142.5-6: "got ist etwaz, daz dâ ist über wesene von nôt, daz in im selber niemannes bedarf und des alliu dinc bedürfen." Cf. to this passage also the following quotations from Eckhart's Latin works: Meister Eckhart, *Sermones et lectiones super Ecclesiastici c*. 24, n. 54, LW II, 282.13-283.1: "[…] deus est rebus omnibus intimus, utpote esse, et sic ipsum edit omne ens; est et extimus,

creatures, God is over them – what is one in many things, should be necessarily over the things. As an example of such a relationship Eckhart indicates the soul, since it is divided in equal measures in all parts of human body,[33] and the now (*daz nû*), conceiving all time in itself and however, transcending all time.[34] The first example quoted by Eckhart derives from Aristotele's *De anima* I, 1, that was reflected later by Thomas Aquinas in his Commentary. Eckhart recalls this characteristic of the soul. The second example demonstrates his familiarity with the time-conception in Augustinus' *Confessiones* XI.

The third answer claims that God is intellect that lives in the cognition of Himself.[35] Hence, "*got ist ein vernünfticheit*" represents the temple in which God lives in order to intelligize and be an intellect. Eckhart defines the life of intellect as the self-cognition (this idea is derived from Aristotle's *De anima* III, 5-6). The *vernünfticheit* is not the intra-divine act only, that serves as self-cognition of God, rather it is equalized with God. Hence, in *Predigt* 9, Eckhart refers in a rudi-

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quia super omnia et sic extra omnia"; Meister Eckhart, *Expositio libri Genesis*, n. 166, LW I, 312.10-11: "Ratio est quia ipse sic totus est in rebus singulis, quod totus est extra."

[33] Meister Eckhart, *Predigt* 9, DW I, 143.5-7: "Diu sêle ist ganz und ungeteilet alzemâle in dem vuoze und alzemâle in dem ougen und in ieglîchem glide"; Cf. also Meister Eckhart, *Expositio libri Exodi,* n. 92, LW II, 95.7-8: "Quaelibet enim pars ignis est, et anima tota in qualibet parte minima corporis, animati." Meister Eckhart, *Sermo* LV, n. 556, LW IV, 465.13-14 : "Exemplum huius in anima, quae vivit in oculo, vivit in aure, in lingua et in omnibus membris." Meister Eckhart, *Expositio libri Sapientiae*, n. 135, LW II, 474.3-5: "Hinc est quod anima non variatur nec senescit nec desinit extracto oculo aut pede, quia ipsa se tota est extra oculum et extra pedem, in manu tota et in qualibet alia parte tota."

[34] Meister Eckhart, *Predigt* 9, DW I, 143.8-144.3: "Daz nû, dâ got die werlt inne machete, daz ist als nâhe dirre zît als daz nû, dâ ich iezuo inne spriche, und der jüngeste tac ist als nâhe disem nû als der tac, der gestern was." To this passage cf. also Meister Eckhart, *Expositio sancti Evangelii secundum Iohannem,* n. 214, LW III, 180.3-6: "Primo: quia ante mundum creatum non fuit aliquod ubi. Unde cuidam sciolo volenti probare aeternitatem mundi et quaerenti, quare deus mundum non prius creavit et postea creaverit, respondi quidem ad hominem quod deus non potuit mundum prius creare, quia ante mundum et tempus non fuit prius"; Meister Eckhart, *Expositio sancti Evangelii secundum Iohannem,* n. 582, 510.1-3: "[…] in deo, utpote in esse, nihil est praeteritum, nihil futurum, sed tantum praesens, id est praesto ens. Unde deus nec mundum creasset, nisi creasse esset creare […]."

[35] Meister Eckhart, *Predigt* 9, DW I, 142.7: "got ist ein vernünfticheit, diu dâ lebet in sîn aleines bekantnisse".

mentary form the assumption declared in *Quaestio Parisiensis* I[36] that outlines the following idea: in God is the intelligizing, the foundation for His being, and God is the intellect.[37]

As Josef Quint notes in the critical edition of German sermons, Eckhart quotes the first two dictums from *Liber vigintiquattuor Philosophorum* very imprecisely. Thus, it is not possible to order them to the certain numeration in *Liber vigintiquattuor Philosophorum*. Only the third statement has an explicit reference to the 20th dictum, declaring that God is one who lives only through His intellect.[38]

Eckhart starts his argumentation by claiming that the "*grobe meister*" identify God with the pure being ("*lûter wesen*").[39] God is rather beingless. He clarifies this in the following way: by saying that God is not being and He is over the being, we do not deny the being to Him, but rather we heighten His being.[40]

Eckhart wants to accommodate his concept of God's beinglessness to Augustinus' *De trinitate*, that is in unison with the position of *via eminentia*:[41] Following Augustinus' reasoning, God is wise without wisdom, good without goodness, omnipotent without omnipotence.[42]

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[36] The relation between *Quaestiones Parisienses* I and the *Predigt 9* is precisely discussed by Misha von Perger in his study: M. von Perger, "*Disputatio* in Eckharts frühen Pariser Quästionen und als Predigtmotiv", in *Meister Eckhart. Lebensstationen-Redesituationen,* hrsg. v. K. Jakobi (Berlin 1997), 115-148.

[37] Meister Eckhart, *Quaestio Parsiensis* I, n. 4, LW V, 40.5-7: " […] Tertio ostendo quod non ita videtur mihi modo, ut quia sit, ideo intelligat, sed quia intelligit, ideo est, ita quod deus est intellectus et intelligere et est ipsum intelligere fundamentum ipsius esse."

[38] Cf. Josef Quint's notice about the *dictum* "*Deus est, qui solus suo intellectu vivit*." in Meister Eckhart, DW I, 142-143.

[39] Meister Eckhart, *Predigt* 9, DW I, 142.7.

[40] Meister Eckhart, *Predigt* 9, DW I; 146.4-6: "Daz ich aber gesprochen hân, got ensî niht ein wesen und sî über wesene, hie mite enhân ich im niht wesen abegesprochen, mêr: ich hân ez in im gehœhet."

[41] Meister Eckhart, *Predigt* 9, DW I, 147.1-2: "Sant Augustînus sprichet: got ist wîse âne wîsheit, guot âne güete, gewaltic âne gewalt."

[42] Augustinus Hipponensis, *De Trinitate*, lib. 5, cap. 1, ed. W. J. Mountain (CCSL 50), Turnhout 1968, l.37: " […] ut sic intelligamus deum si possumus, quantum possumus, sine qualitate bonum, sine qualitate magnum, sine indigentia creatorem, sine situ praesentem, sine habitu omnia continentem, sine loco ubique totum, sine tempore sempiternum, sine ulla sui mutatione mutabilia facientem nihil que patientem".

So, according to Augustinus, God is unpredictable, as there is no predicate appropriate to God. Susanne Köbele interprets the whole *Predigt* 9 from this Augustinian point of view when she claims that for Eckhart the beinglessness of God is equal of His namelessness.[43]

Here it needs to be asked, if this is the Eckhartian intention in the *Predigt* 9 in fact?

In order to answer this question, we should carefully inquire into those text passages where Meister Eckhart talks about God's beinglesness. He does not refer to this issue in *Predigt* 9 for the first time. Hence, this statement needs to be discussed in the context of Eckhart's entire work. As already mentioned, we find the thesis of God's beinglesness initially in the *Quaestio Parisiensis* I, where Eckhart states that cognition, i.e., intelligizing, is the foundation for being. Given the fact that *Predigt* 9 is included in *Paradisus anime intelligentis* as Eckhart's subsequent defence (*Verteidigungsschrift*), it explains here the function of Augustinus' quotation as well: Eckhart tries to ascribe his teaching about the beinglessness of God derived from his intellect's theory to Augustinus, and in such a way to accommodate Augustinus' teaching to his own doctrine. He outlines the horizon, where God's *quidditas* is to think. The essential question is here in unison with *Quaestio Parisiensis* I, rather than with Augustinus' *De trinitate*.[44] The evidence for this assumption is demonstrated by the third Answer from *Liber viginti quattuor philosophorum* that Eckhart refers to in the beginning of the *Predigt* 9: God is intellect, living only in self-cognition and self-intelligizing. Therefore, first of all God is claimed to be a cognitive subject that is self-reflexive. As a self-cognitive subject, He is without determination and without mode; He determines himself through His cognition, that is not an accomplished act, but rather fulfils permanently and

[43] Köbele, "Bîwort sîn. 'Absolute' Grammatik bei Meister Eckhart", 193.

[44] Christa Ortmann reconstructed the argumentation presented in *Predigt 9* from the general background of Eckhart's Latin works. Cf. Ch. Ortmann, "Eckharts Lehre für die Ungelehrten. Zum Verhältnis von Deutsch und Latein in der deutschen Predigt", in *Befund und Deutung. Zum Verhältnis von Empirie und Interpretation in Sprach- und Literaturwissenschaft (FS für H. Fromm)*, hrsg. v. K. Grübmüller, Tübingen 1979, 342-391; Regarding the relation of Latin *Quaestiones* and German Sermons see also Perger, "*Disputatio* in Eckharts frühen Pariser Quästionen und als Predigtmotiv", 115-148.

without finality.[45] So, He is "wîse âne wîse,"[46] without determination, as the determining mode is only available after the finished cognitive act in the intellect.

While discussing the question about God's *quidditas* in *Predigt* 9, Eckhart refers the semantic issue related to God's predication as well. He starts with an example of *baccalaurii theologiae*, which teach that none of the ten Aristotelian categories refer to God and that they should to be denied in regard to God: the first among ten categories that possess the plenty of being and in which all things receive their being, is the substance, and the last, that possess the minor being, is the relation. But in God the plenty and the minor are equal, says Eckhart.[47] This demonstration corresponds to Eckhart's considerations in *Expositio libri Exodi* n. 62.[48] Consequently, ten predicaments refer to God not in the same way as to creatures, rather they "*transeunt*" in the divine substance; hence, they refer to God as really identical with divine substance; moreover, as inherited by divine substance.

Eckhart considers the theses about God as an absolute being and about God's beinglessness, as convertible in some sense. This idea is

[45] Loris Sturlese characterised the Eckhartian *intelligere* as follows: "Diametral entgegengesetzte Eigenschaften kämen dem Denken (*intelligere*) zu: Es sei nicht kategorial faßbar, es entziehe sich somit den Gesetzen der aristotelischen Substanzontologie und sei vielmehr Verneinung jeder formalen Bestimmtheit, daher nicht-seiend und nicht-geschaffen." L. Sturlese, "Meister Eckhart: Ein Porträt", in *Homo divinus. Philosophische Projekte in Deutschland zwischen Meister Eckhart und Heinrich Seuse*, hrsg. v. L. Sturlese, Stuttgart 2007, 15-34, 22. The close analyses of Eckhart's *Quaestio* is to be found in R. Imbach, *Deus est intelligere. Das Verhältnis von Sein und Denken in seiner Bedeutung für das Gottesverständnis bei Thomas von Aquin und in den Pariser Quaestionen Meister Eckharts*, Freiburg 1976, 153-157.

[46] Eckhart uses the formulation "wîse âne wîse" as the expression of the highest indeterminateness. Meister Eckhart, *Predigt* 9, DW I, 144.8-9: "[…] got ze minnenne daz ist wîse âne wîse."

[47] Meister Eckhart, *Predigt* 9, DWI, 147.5-8: "Diu êrste, diu des wesens allermeist hât, dâ alliu dinc wesen inne nement, daz ist substancie, und daz leste, daz des wesens aller minnest treit, daz heizet relatio, daz ist glîch in gote dem aller grœsten, daz des wesens allermeist hât."

[48] Meister Eckhart, *Expositio libri Exodi,* n. 62, LW II, 66.14-67.3: "Ex praemissis, ubi dictum est, quod deus est et operatur omnia sua substantia, patet quod in deo est unicum praedicamentum, scilicet substantia, qua est qua potens est, qua sapiens est, qua bonus est et huiusmodi, quae in creaturis pertinent ad praedicamenta novem accidentis."

demonstrated in *Predigt* 9 as follows: perceiving God in His being, we perceive Him in His atrium, as the being is His atrium, where He lives. Here Eckhart poses the question: where is He in his temple, in that He illuminates? And he answers this question by stating that the intellect is God's temple – He lives nowhere more real than in His temple, in the intellect.[49]

This metaphor "temple of God" explains the relation between God and being in Eckhart's metaphysics: the being as well as beinglessness characterize the essence of God, but in a different way. The being expresses God's *quidditas*, but it is only an atrium ("Vorhof") in comparison to the temple of God, an intellect that is equated with God and is determined as beingless. According to Eckhart, God is the intellect that lives in His temple only in His self-cognition and persists only in Himself; there is He only in His calmness; God cognizes Himself in the cognition of Himself in Himself.[50] To be in the calmness ("stilheit"), maintains that God is the intellect, free from relation to something. The only relation that the intellect experiences is self-cognition: God cognizes Himself, in Himself, by Himself. Through cognition God acts in non-being and gives the being: The soul can intelligize in order to conceive in itself the things that are not present. So, with intelligizing, the soul works in non-being: it gives the being to the abstract or non-real objects while it intelligazes them. Eckhart concludes that, by the power of acting in the non-being, the soul follows, imitates God, since God is one, who acts in the non-being.[51] The work of the soul is the cognition, intelligizing that gives being to the non-being. In such a way the gnoseological creates a foundation to the ontological entity: what is cognized becomes being. Through cognition, the intellect brings a kind of beingness, existing only through the fact that it has been cognized. According to Eckhart, only the intellect can perceive God free from Good-

[49] Meister Eckhart, *Predigt* 9, 150.1-4: "Als wir got nemen in dem wesene, sô nemen wir in in sînem vorbürge, wan wesen ist sîn vorbürge, dâ er inne wonet. Wâ ist er denne in sînem tempel, dâ er heilic inne schînet? Vernünfticheit ist der tempel gotes. Niergen wonet got eigenlîcher dan in sînem tempel, in vernünfticheit […]."

[50] Meister Eckhart, *Predigt* 9, 150.5-7: "[…] got ist ein vernünfticheit, diu dâ lebet in sîn aleines bekantnisse, in im selber aleine blîbende, dâ in nie niht engeruorte, wan er aleine dâ ist in sîner stilheit. Got in sîn selbes bekantnisse bekennet sich selben in im selben."

[51] Meister Eckhart, *Predigt* 9, 151.11-12: "[…] mit dirre kraft würket diu sêle in unwesene und volget gote, der in unwesene würket."

ness, being and all names, i.e., free from all determinations.[52] Only the intellect can cognize that God is intellect. Meister Eckhart claims that the intellect is more noble than the will: "vernünftiheit edeler ist dan wille."[53] With these words he starts the decisive passage in which he does not connect human beatitude with the concept of goodness, but rather with the concept of intellect: human beatitude comes through the fact that God is intellect and the human being intelligizes this.[54] Therefore, Meister Eckhart does not understand the beatitude as a consequent of an ethical, but rather as a consequent of the gnoseological, since the gnoseological makes here a foundation for the ethical: that, what is cognized, is through this cognition not only being, but good as well. Hence, in *Predigt* 9 is found the prevalence of the gnoseological to the ontological and ethical domains – the very typical turn for Eckhart that we meet first in *Quaestio Parisienses* I.

After discussing the questions "What is God?" and "What is the temple of God?" Eckhart refers very briefly to the issue of God's predication. He claims that the most proper, what is possible to say about God, is the word and the truth – God named himself as word.[55] In this context Eckhart differentiates the three types of words and gives a certain theologically modified reflection, with roots ascribed to *Peri Hermeneias* (Περὶ Ἑρμηνείας) 16a.[56] These three types of words are as follows: the first is the uttered word, that designates the angels, hu-

[52] Meister Eckhart, *Predigt* 9, 153.3-5: "Wille nimet got under dem kleide der güete. Vernünfticheit nimet got blôz, als er entkleidet ist von güete und von wesene."

[53] Meister Eckhart, *Predigt* 9, 153.3.

[54] Meister Eckhart, *Predigt* 9, 153.9-12: "Dâ von enbin ich niht sælic, daz got guot ist. Ich enwil des niemer begern, daz mich got sælic mache mit sîner güete, wan er enmöhte ez niht getuon. Dâ von bin ich aleine sælic, daz got vernünftic ist und ich daz bekenne."

[55] Meister Eckhart, *Predigt* 9, 154.7-155.11.

[56] Meister Eckhart, *Predigt* 9, 157.3-8: "Ez ist ein vürbrâht wort, daz ist der engel und der mensche und alle crêatûren. Ez ist ein ander wort, bedâht und vürbrâht, dâ bî mac ez komen, daz ich in mich bilde. Noch ist ein ander wort, daz dâ ist unvürbrâht und unbedâht, daz niemer ûzkumet, mêr ez ist êwiclich in dem, der ez sprichet; ez ist iemermê in einem enpfâhenne in dem vater, der ez sprichet, und inneblîbende." Köbele characterizes the relation expressed in this passage as follows: "Was im ersten und zweiten Predigtabschnitt noch getrennt verhandelt war, die Selbsterkenntnis Gottes und die Gotteserkenntnis des Menschen, gilt hier – als Selbsterkenntnis Gottes im Menschen und umgekehrt – reflexiv und transitiv zugleich." Cf. Köbele, "Bîwort sîn. 'Absolute' Grammatik", 195.

mans and all creatures; The second is the word that is conceived and expressed, through it is possible that we intelligize or perceive something; and the third is the word that is neither expressed nor intelligized, that never comes out, rather it is eternal and stays in that person (i.e., trinitarian hypostasis – Father), who expresses it. Here we observe already that Eckhart's semantical considerations in *Predigt 9* are very close to Augustinus, as the third type of word reminds us of Augustinus' famous formulation from Sermo 288: "*attendit ille qui concepit uerbum quod dicat, et notum habet uerbum sibi in corde suo, attendit cui dicturus est*."[57] This Augustinian modification in definition of semantical entities in this *Predigt* 9 is to explain through the fact that this is Eckhart's defence (*Verteigungsschrift*), where he tries to accommodate his teaching and his theory of predication with the doctrine of Church authorities.

Conclusion

According to the main theses of *Predigt 9*, God is not a pure being but rather beingless, God is intellect, God cognizes himself and works through cognition. Thus, it belongs to the line of thought that started in Eckhart's works with *Quaestio Parisienses* I dated back to 1302-1303. Even more, it represents a "translation" of Eckhart's theory of intellect in the visual image of metaphorical language: according to Eckhart, the "temple of God", the metaphor for intellect, is a proper locus of God's existence. Hence this metaphor turns to the visualization of the process of God's self-intelligizing and His self-cognition already demonstrated in *Quaestio Parisienses* I in a very speculative way. With the example of *Predigt* 9 we observe how "iconic turne" makes possible visualization of the speculative ideas presented in Eckhart's Latin works.

Ilia State University, Tbilisi

[57] Augustinus, *Sermo* 288: *De Voce et Verbo*, PL 38, Paris 1863, 1302-1308, 1305.

Visual Perception and Knowledge of God in Jean Gerson's *Tractatus de oculo*

Luciano Micali

1. Introduction

Since the early years of the past century, Jean Gerson[1] and his works caught the attention of several specialists of the history of late medieval thought; object of a huge amount of scholarly literature throughout the decades, the enormous and multifarious production of the Parisian Chancellor[2] has been studied mainly from a theological and ecclesio-

[1] About the life of Gerson, cf. B. P. McGuire, "In Search of Jean Gerson: Chronology of his Life and Works", in *A Companion to Jean Gerson,* ed. B. P. McGuire, Leiden-Boston 2011, 1-40; Cf. P. Glorieux, "La vie et les œuvres de Gerson. Essai chronologique", *Archives d'Histoire Doctrinale et Littéraire du Moyen Âge* 25-26, (1950-1951), 149-191.

[2] On Gerson's mystical production, cf. M. Vial, *Jean Gerson théoricien de la théologie mystique,* Paris 2005; cf. Id., "Théologie mystique et syndérèse chez Jean Gerson", in *Vers la contemplation. Études sur la syndérèse et les modalités de la contemplation de l'antiquité à la Renaissance*, ed. C. Trottmann, Paris, Honoré Champion, 2007, 215-232; cf. Id., "Théologie mystique et expérience chez Jean Gerson", *Revue de Théologie et de Philosophie* 142 (2010), 229-243; cf. Y. Matusevich, *Le siècle d'or de la mystique française: un autre regard. Étude de la littérature spirituelle de Jean Gerson (1363-1429) à Jacques Lefèvre d'Étaples (14507-1537)*, Paris 2004. Cf. Id., "Gerson's Legacy", in *A Companion*, ed. P. B. McGuire, 357-400. cf. A. Combes, *Essai sur la critique de Ruysbroeck par Jean Gerson*, vol. I, Paris 1945; cf. Id., "La théologie mystique de Gerson: profil de son évolution", *Etudes Philosophiques* 19, 3 (1964), 444-545; cf. P. Glorieux, "L'enseignement universitaire de Gerson", *Revue de Théologie Ancienne et Médiévale* 23, 1956, 88-113. Glorieux realized the standard critical edition of Gerson's complete Latin and French works: cf. Id., *Jean Gerson. Œuvres complètes*, Paris 1960-1973. On Gerson as "modern intellectual"cf. D. Hobbins, "The Schoolman as Public Intellectual: Jean Gerson and the Late Medieval Tract", in *The American Historical Review* 108, 2003, 1308-1337; cf. Id., *Authorship and Publicity before Print. Jean Gerson and the Transformation of Late Medieval Learning*, Philadelphia 2009, 152-182.

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logical point of view. In his pastoral activity,[3] in his role of professor, chancellor, and of spiritual advisor,[4] the deep theological speculation of this late medieval master can be brought back to the urgency of preserving doctrinal and ecclesiological unity in the Church.[5] His stances in every huge academic and doctrinal debate of his time,[6] his conciliarism,[7] and his active criticism against radical religious movements[8] or books perceived as dangerous and suspect of heresy[9] show Gerson's concern

[3] This area of Gerson's activity has been throughly studied by N. McLoughlin, "Gerson as a Preacher between Mendicants and Secular Priests", in *A Companion*, ed. B. P. McGuire, 249-253.

[4] About Gerson's activity of spiritual advisor of monks and nuns, cf. I. Iribarren, "Jean Gerson, Spiritual Advisor to the Celestines", in *Autorität und Wahrheit. Kirchliche Vorstellungen, Normen und Verfahren (13. - 15. Jahrhundert)*, hrsg. v. G. Potestà und E. Müller-Luckner, München 2011, 159-178.

[5] About Gerson's concern for the doctrinal and ecclesiological unity, cf. B. P. McGuire, *Jean Gerson and the Last Medieval Reformation*, University Park 2005, 89; cf. also L. B. Pascoe, *Jean Gerson: Principles of Church Reform*, Leiden 1973.

[6] On this aspect, cf. Z. Kaluza, "La doctrine selon Jean Gerson"*,* in *Vera Doctrina. Zur Begriffsgeschichte Der Lehre Von Augustinus Bis Descartes / L'idee De Doctrine D'augustin a Descartes,* hrsg. v. P. Büttgen, R. Imbach, U. J. Schneider, und H. J. Selderhuis, Wiesbaden 2009, 115-140; cf. Z. Kaluza, *Les querelles doctrinales à Paris. Nominalistes et réalistes aux confins du XIV et du XV siècles,* Vol. II*,* Bergamo 1988.

[7] On the conciliarism of Gerson, cf. F. Oakley, "Gerson as Conciliarist", in *A Companion,* ed. B. P. McGuire, 179-204; cf. G. H. M. Posthumus Meyjes, *Jean Gerson. Apostle of Unity : his Church Politics and Ecclesiology,* Leiden-New York 1999; cf. B. Sère, *Les débats d'opinion à l'heure du Grand Schisme. Ecclésiologie et politique,* Turnhout 2016.

[8] Cf. Gerson, *De mystica theologia,* 255.39-256.3, ed. P. Glorieux, Oeuvres completes, vol. III, Paris 1962, where the Chancellor cites the Beghards as examples of people who ignore the rules and the order and as fanatics whose ideas are not *secundum scientiam*. On Gerson's criticism of the Beghards, cf. R. E. Lerner, *The Heresy of the Free Spirit in the Later Middle Ages*, Berkeley-Los Angeles-London 1972, 165.

[9] The most relevant features of Gerson's attitude towards books perceived (for any reason) as dangerous can be found in his criticism to the *Roman de la Rose,* the allegorical poem started by Guillaume de Lorris and finished by Jean de Meung: cf. R. Blumenfeld-Kosicki, *Jean Gerson and the Debate on the Roman de la Rose,* in *A Companion*, ed. B. P. McGuire, 317-356. From this perspective, it is also interesting to consider the case of the censure against Ruusbroec's masterpiece *Die geestelijke Brulocht*: cf. A. Combes, *Essai,* Vol. I, 664. A similar case is Gerson's criticism of the Franciscan Ubertino da Casale's *Arbor vitae crucifixae Iesu;* cf. D. Hobbins, "Gerson on Lay Devotion"*,* in *A Companion to Jean Gerson,* ed. B. P. McGuire, Leiden-Boston 2011, 62-63.

about possible divisions within not only Christianity as a whole, but also specifically within the university; as a theology professor and a chancellor of the University of Paris, Gerson clearly perceives the role of this institution in determining the spread or the stoppage of texts and ideas.[10] Moreover, he is aware of the philosophical and theological consequences of allowing or limiting their circulation.[11]

2. The treatise in the frame of Gerson's production

Part of this attempt to control dangerous ideas is the Gersonian effort, especially towards the last part of his life, to set the borders of mysticism and to express how mystical theology should be intended.[12] In fact, it's in Lyon, in the last ten years of his life, that the Parisian Chancellor edits his final revision of one of his masterpieces, the treatise *De mystica theologia*, but he also writes a new work with the aim to specify how to correctly understand his own work on mystical theology: the meaningful title of this second treatise is *Elucidatio scholastica mysticae theologiae*.[13] The attempt to describe and control spirituality and concepts like "ecstasy," "mystical union," "vision of God" represents a

[10] Cf. McGuire, *Jean Gerson,* 240-283.

[11] This concern touches the University of Paris at all levels and involves the hierarchies. Famous and rich of consequences is the case of Tempier's condemnation of 219 philosophical propositions circulating at the Faculty of Arts in 1277. Gerson often refers to this condemnation and to the censured articles, warning the students and the masters about avoiding following those philosophical doctrines: cf. Gerson, *Nova positio*, 150-120, éd. P. Glorieux, in *Œuvres complètes*, vol. VI, Paris 1965. On Tempier's condemnation in the frame of the process of control of texts and doctrines circulating at the University of Paris during the Late Middle Ages, cf. M. M. H. Thijssen, *Censure and Heresy at the University of Paris. 1200-1400*, Philadelphia 1998, 40-56; cf. M. M. H. Thijssen, "What Really Happened on 7 March 1277? Bishop Tempier's Condemnation and Its Institutional Context", in *Texts and Contexts in Ancient and Medieval Science-Studies on the Occasion of John E. Murdoch's Seventieth Birthday*, ed. E. Sylla and M. McVaugh, Leiden 1997, 84-114; cf. S. Piron, *Le plan de l'évêque: pour une critique interne de la condamnation de 1277*, *Recherches de Théologie et Philosophie Médievales* 78, 2 (2011), 383-415; cf. L. Bianchi, "1277: A Turning Point in Medieval Philosophy?", in *Was ist Philosophie im Mittelalter?*, ed. J. A. Aertsen and A. Speer, Berlin-New York, 90-110; cf. A. De Libera, *Philosophie et censure,* in *Was ist Philosophie*, hrsg. v. J. A. Aertsen, A. Speer, 71-89.

[12] Cf. Vial, *Jean Gerson,* 10.

[13] Cf. McGuire, "In Search", 28-32.

fil rouge in Gerson's production for mainly one reason: God represents the end towards which every human action and feeling should be finalized.[14] If reaching God substantially is something that a human being can possibly only obtain *in patria*, God's most eminent creature, possessing in itself a sort of divine spark, is instinctively driven by his own nature of God's creature towards the search of God and the attempt to become nearer to the source of his life.[15]

Against the background of this interest for describing mysticism and setting the borders of it, some late treatises of a more philosophical content, like *Tractatus de oculo* or *Centilogium de causa finali*,[16] discuss philosophical topics under a theological perspective, always with the aim to reconstruct specific aspects of the relationship between the human being and God.

In this contribution I will specifically focus on one of these philosophical works, *Tractatus de oculo*,[17] devoted to the visual perception and to the various forms of visions of God *in via*. A specific attention will be paid to how in this treatise the Parisian Chancellor investigates the relationship between the intellectual dimension and the spiritual and moral dynamics leading to the vision. This contribution will also represent the occasion to underline the importance of this very little studied Gersonian work for a better understanding of some notions and ideas that are mentioned in other Gersonian treatises or letters.

Throughout his career*, Doctor christianissimus* devotes a great attention to the close relationship between events like visions and the moral, intellectual and spiritual order which allows or denies them; in several works, Gerson refers to the concept of *discretio spirituum*,[18] through which

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[14] Gerson devotes a treatise to this topic, the *Centilogium de causa finali.* Cf. Gerson, *Centilogium de causa finali,* ed. P. Glorieux (Oeuvres completes 9), 613.34-625.16, Paris 1973.

[15] Cf. Gerson, *A Barthélémy Clantier I*, 60.4, ed. P. Glorieux (Oeuvres completes 2), Paris 1960.

[16] Cf. McGuire, "In Search", 28-32.

[17] I will use the edition of P. Glorieux; cf. Gerson, *Tractatus de oculo*, ed. P. Glorieux (Oeuvres completes 8), 149-154, Paris 1971.

[18] On this concept cf. G. M. Ragazzi, *Obeying the Truth. Discretion in the Spiritual Witings of Saint Catherine of Siena*, Oxford 2014, 108-131. Cf. P. Boland, *The Concept of Discretio Spirituum in Jean Gerson's De probatione spirituum and De distinctione verarum visionum a falsis*, Washington 1959.

the theologian can understand whether a vision is inspired by God or not. One of the main rules that the theologian follows in order to provide the *discretio* is the analysis of the behaviors and moral attitude of the person who affirms to have visions: therefore, concepts like humility, wisdom of the heart, and fear of God play a role in determining the divine illumination,[19] which then allows a true static vision; at the same time, moral and intellectual vices, such as arrogance, vanity, and pride are seen as proof of a non divine inspiration or even a diabolic one.[20] To the concept of *discretio* Gerson devotes two very important treatises in two different moments of his life: the first one is *De distinctione verarum revelationum a falsis*, which originates from an academic lecture on the gospel of Mark, and is written in 1401;[21] the second treatise is *De examinatione doctrinarum* and belongs to the last stage of his life, having been written in 1423.[22] Both works insist on the necessity of determining the subsistence of the correct moral attitudes of the visionary in order to trust his or her visions and to assert that he or she really is divinely illuminated.[23]

Notions like purification, divine illumination, deep faith are again part of the argumentation in *Tractatus de oculo*, that Gerson writes in 1424, one year after *De examinatione doctrinarum* and five years before his death in 1429.[24] Among the works of *Doctor christianissimus*, this short treatise maybe represents the most systematic and in-depth reflection on the notion of vision (in its various meanings and forms); in fact, if in other gersonian works vision is mostly conceived in its spiritual and mystical meanings, without deep, specific references to the concrete process of seeing and perceiving,[25] here in *De oculo* the

[19] Cf. Gerson, *De distinctione verarum revelationum a falsis* 45.39; *De auferibilitate sponsi ab Ecclesia* 297.4.

[20] Cf. Gerson, *De distinctione verarum revelationum a falsis* 56.19.

[21] Cf. McGuire, "In Search", 13. Cf. W. L. Anderson, "Gerson's Stance on Women", in *A Companion,* ed. B. P. McGuire, 299-302.

[22] Cf. McGuire, "In Search", 31.

[23] Cf. *Ibidem*; cf. n. 19.

[24] Cf. R. Blumenfeld-Kosicki, "Jean Gerson", in *A Companion*, ed. B. P. McGuire, 332.

[25] Such kind of references can be especially found in some spiritual and pastoral works: cf. Gerson *Collectorium super Magnificat* 311.29, ed. P. Glorieux, vol. VIII; Gerson, *De meditatione cordis* 81.9, ed. Glorieux, vol VIII, and *Super cantica canticorum* 612, 26, ed. P. Glorieux, vol. VIII.

author systematically analyzes the concept of vision, proceeding from the perception through the sensorial eye and arriving at the classification of the various ways through which, and the conditions in which, the vision of God is allowed.

3. The structure and aim of *De oculo*

The *Tractatus de oculo* contains 40 propositions and is divided into three parts: in the first part (12 propositions),[26] the author deals with the various ways in which it is possible to consider the notion of eye; the second part (12 propositions)[27] concerns the various objects of different kinds of visual perception according to the different meanings of *oculus* that we can take into account; the third part (16 propositions)[28] is about the mental vision of God in its multiple forms.

The author begins the treatise by quoting Luke 10, 23 (*beati oculi qui vident quae vos videtis*)[29] and uses this passage of the Gospel in order to introduce the matter of his treatise, consisting in a reflection on the *oculus multiplex,* an expression which identifies the various levels of visual perception, including into these possibilities not only the strictly sensorial perception, but also those deriving from a mental elaboration of the physical perception and even those which do not firstly come from a bodily perception, but from an interior, spiritual movement of the soul.[30] Gerson explains this idea by extending the concepts of light, manifestation, and eye from the merely physical dimension to the intellectual one, by affirming that like the eye represents the perceiving power (*vis perceptiva*), in the same way, through the illumination, "everything that perceives a manifestation can be said as eye" (*omne quod manifestationem percipit oculus dici potest*).[31] This can happen, according to Gerson, in three ways: *intellectualiter, rationaliter, sensualiter.*[32] Most of the attention is given by the author to

[26] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 149-151

[27] Gerson., *Tractatus de oculo,* ed. Glorieux, 151-152.

[28] Gerson., *Tractatus de oculo,* ed. Glorieux, 152-154.

[29] Gerson, *Tractatus de oculo,* 149.22.

[30] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 149.23-27.

[31] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 149.29.

[32] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux, 149.32.

the examination of what the intellectual eye is and to which objects of knowledge it applies its faculty: while the sensorial eye is only defined as a *vis perceptiva* merged with the motion and continuity and with the *hic et nunc* of the manifestation,[33] the intellectual eye is defined as a *vis perceptiva et abstractiva*, identifying this intellectual dimension of the vision with a step which comes after that of the perception. In fact, Gerson explains that the intellectual eye is not with (*cum*) the motion and continuity, but it abstracts from the motion and continuity, as well as from the *hic* et *nunc*.[34]

4. The three kinds of intellectual eye

Later, the author illustrates the three kinds of intellectual eye: the divine, the angelic and the human one.[35] The divine one is not really defined or described, and this fact can be explained with the impossibility to properly describe or define something belonging to the essence of God, since God cannot be the object of a full knowledge *in via*[36]. A concrete and true knowledge of God can only happen *in patria*, when the human being is no longer in the path of life and finally reaches the eternal joy of the essential union with God.[37] During the earthly life this is not possible and this is why Gerson only affirms about the "divine eye" that it is the eye "through which God looked at the humility of His servant,"[38] with a clear reference to the *Magnificat.* The statement is accompanied by a quotation from the book of Wisdom: "The eyes of the Lord are more luminous than the sun." In this context, the di-

[33] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 150.6.

[34] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux, 150.1.

[35] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux 150.3.

[36] Cf. Gerson, *Collectorium super Magnificat*, 592.41; cf. *Anagogicum de hymno gloriae* 550.30, ed. P. Glorieux, vol. VIII.

[37] This concept has solid and old roots in the history of Christian thought. As mere examples we can refer to Augustinus, *De doctrina christiana,* lib. I, cap. 34, ed. I. Martin (CCSL 32), Turnhoult 1962, 28.20-24,. In this chapter, Augustine explains that the earthly knowledge should not *tenere* the human being in his *transire* from the path of life to the enjoyment of the Truth in the eternal life. Gerson recalls this concept in many passages; just a few examples are Gerson, *Collectorium super Magnificat,* ed. Glorieux 185.12; Gerson, *Anagogicum de hymno gloriae,* ed. Glorieux 544. 20; 556.32.

[38] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux, 150.4-6.

vine eye is defined only in an indirect way through its most important feature, which is God's omniscience and His power of inspecting the human heart.

If this description informs about the nature of the *oculus divinus* through its activity *ad extra*, towards the human being, in another part of *Tractatus de oculo* we find a statement oriented towards the internal, trinitarian dimension; Gerson affirms: *Objectum oculi divini est eius essentia in sui puritate recepta, sive visio sit essentialis sive personalis*.[39] In this passage, Gerson describes how God looks at Himself, contemplating His own essence, substance, *ousía*, received and perceived by God himself in its purity, because immediate (in the sense of "without mediation"), while every possible human grasp *in via* of the essence of God is always partial and mediate, even if through the visible things investigated by the intellect, the theologian can actually know a number of things about the Creator and about its relationship with the created world;[40] in the heavenly Fatherland God will be known as He is. In this passage, it is specified that the pure essence of God is received by Himself both in the dimension of the divine essence shared by the three persons of the Trinity and in the dimension of each single person of the Trinity.

If the act of the *oculus intellectualis divinus* coincides with its own, receiving its own divine essence without any mediation and without any potentiality, being pure act in the contemplation of its pure essence, the *oculus intellectualis angelicus* is described by Gerson as a perceptive power, whose act doesn't coincide with its essence, but contemplates at the same time two kinds of species of things as objects of knowledge: 1. the innate species caused or disposed (*inditas*) by God; and 2. the acquired species received (*receptas*) from the things.[41]

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[39] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 151.25-27.

[40] Cf. Augustinus, *De vera religione*, c. 29, ed. I. Martin (CCSL 32), Turnhout 1962, 21.1-3: "videamus quatenus ratio possit progredi a visibilibus ad invisibilia et a temporalibus ad aeterna conscendens". This is a key-concept in medieval theology; cf. Bonaventura, *Commentarius in evangelium Sancti Iohannis* (Opera omnia 6), ed. PP. Collegii a S. Bonaventura, Ad Claras Aquas 1893, 243.1.7; 318.1.4, ; cf. Thomas de Aquino, *Summa theologiae,* q. 43, art. 7, ed. Leonina, Romae 1894; cf. Hugo de Sancto Victore, *De archa Noe,* 4, 6, ed. P. Sicard (CCCM 176), Turnhout 2001.

[41] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 150.33: "Oculus angelicus est vis perceptiva rerum non sine actu distincto a substantia sua, per species rerum vel innatas vel acquisitas tam sine discursu quam cum discursu, tam incomplexe quam complexe, necnon universaliter et distincte; et hoc per species tam inditas a Deo quam a rebus, ut

Therefore, the angelic eye is addressed towards the knowledge of both the universals and the distinct things, but Gerson highlights that the angelic knowledge of the distinct things happens *aliter quam per sensum*. Examining the properties and acts of the angelic eye, the author shortly comes back to the *oculus intellectualis hominis*, stating that the human intellectual eye perceives things in the way of the angelic eyes, but with far less strength (*per modum intellectualis oculi angelici, sed vigore longe dissimili*)[42].

Therefore, the intellectual eye of the human being shares with the angelic one the *modus* of the perception, while the intensity of it is different: the human being is *in via* and depends on the fallacy of every aspect of the mortal life, including the presence of the body and of the sins deriving from the bodily instincts. According to Gerson, both in the contemplation of the universals and of the distinct things, the human intellectual eye can be damaged; in fact, the author goes further in the analysis of this relationship between intellectual perception and sin by making an explicit reference to a passage of Hugh of Saint Victor's *De sacramentis christianae fidei*, where Hugh defines as *extinctus* the intellectual eye after Adam's sin and compares it to the physical eye that is infected and to the eye of reason that is obnubilate.[43] Gerson closes this reflection on the intellectual eye by stating that the intellectual eye "cannot be repaired without the incarnate Word, which illuminates the human beings and purifies through faith their hearts."[44]

These words clearly refer to the docility that should characterize the human being who accepts the illumination coming from the faith in Jesus Christ, an illumination that many Christian thinkers put at the

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videtur, acceptas; sed aliter quam per sensum; alioquin difficile est salvare punitiones demonum et separatarum animarum, cognitiones insuper singulares angelorum, necnon locutiones ipsorum inter se et nobiscum".

[42] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 151.4-9.

[43] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 151.10-12: "Oculus intellectualis humanus, secundum Hugonem, extinctus fuit sicut oculus carnis infectus et oculus rationis contenebratus Adam peccante, dum comparatus est jumentis insipientibus et similis factus est illis". Cf. Gerson., *De mystica theologia,* 27.25-27, ed. P. Glorieux (Oeuvres Complètes 3), Paris 1962. Cf. Hugo de Sancto Victore, *De sacramentis christianae fidei,* lib. 1, pars 10, cap. 2, PL 176, 1880: "Hos igitur oculos quamdiu anima apertos et revelatos habebat, clare videbat et recte discernebat; postquam autem tenebrae peccati in illam intraverunt, oculus quidem contemplationis extinctus est, ut nihil videret".

[44] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux,151.13-14.

beginning of their works as a condition for fulfilling their intellectual tasks; an exemplary case could be that of *De doctrina christiana*: at the very beginning of the treatise, Augustine declares his impossibility to properly deploy his intellectual speculation without the help of God's illumination.[45]

At the same time, through these words Gerson links faith not only with the illumination of the intellect, but also with the purification of the heart, because only a purified heart can allow the human being to search for wisdom and not simply for knowledge; following the lesson of Augustine,[46] adopted entirely by Thomas and Bonaventure[47] (two great models of Gerson) in some *quaestiones*,[48] the *Doctor christianis-*

[45] Cf. Augustinus, *De doctrina christiana,* lib. 1, cap. 1, ed. Martin, 6.6-9

[46] Cf. Augustinus, *De doctrina christiana*, I, 4.8, ed. Martin. Cf. Augustinus, *De vera religione*, c. 29, 1-12, ed. Martin: "videamus quatenus ratio possit progredi a visibilibus ad invisibilia et a temporalibus ad aeterna conscendens. […] In quorum consideratione (the things of the world), non vana et peritura curiositas exercenda est, sed gradus ad immortalia et semper manentia faciendus". On the concept of *vana curiositas* in Augustine and through the Middle Ages, cf. H. Oberman, *Contra vanam curiositatem. Ein Kapitel der Theologie zwischen Seelenwinkel und Weltall*, Zürich 1974; cf. J. Torchia, *Restless mind. Curiositas and the Scope of Inquiry in Augustine's Psychology*, Milwaukee 2013, 39; cf. J. Hamburger, *Speculations on Speculation*, in *Deutsche Mystik im abendländischen Zusammenhang*, hrsg. v. W. Haug und W. Schneider-Lastin, Tübingen 2000, 369. For a detailed study about the concept of curiosity in Augustine's works, cf. J. Torchia, *Restless Mind.*

[47] Cf. Gerson, *À Barthélemy Clantier II,* 98.18-20. On Bonaventure as a theological model for Gerson, cf. M. Schlosser, *Bonaventure: Life and Works*, in *A Companion to Bonaventure*, ed. J. M. Hammond, J. A. W. Hellmann and J. Goff, Leiden-Boston 2014, 57. Cf. D. Hobbins, *Authorship*, 18; cf. S. Grosse, "Johannes Gerson und Bonaventura: Kontinuität und Diskontinuität zwischen Hoch- und Späatmittelalter", in *Herbst des Mittelalters? Fragen zur Bewertung des 14. und 15 Jahrhunderts,* hrsg. v. J. A. Aertsen und M. Pickavé, Berlin-New York 2004, 340-348. Cf. Gerson, *À un frère mineur,* 277.18: "Secutus est doctor iste (Bonaventura), se testante, doctrinam communem et solidam quae Parisius vigebat maxime tempore suo". Thomas is often cited by the late scholastic master as an agglutinant, reference point and as *doctor communis*. Cf. Wycliff, *Sermones, Sermo* 50, 436. 27, ed. J. Loserth, 1887-1890; cf. Dionysius Cartusianus, *Enarratio in librum Deuteronomii,* art. 1, 524.27 (Opera omnia 2), Typis Cartusiae Sanctae Mariae de Pratis 1897.

[48] Cf. Thomas de Aquino, *Summa theologiae*, q. 167, art. 1; cf. Bonaventura, *Commentarius in Ecclesiasten,* cura et studio PP. Collegii a S. Bonaventura (Opera Omnia 6), Ad Claras Aquas 1893, 62.1.39; 97.2.34; cf. Bonaventura, *Commentarius in evangelium sancti Lucae,* cura et studio PP. Collegii a S. Bonaventura (Opera Omnia 7), Ad Claras Aquas 1893, 315.1.33 437.2.2,

simus often insists on the dangers, in the intellectual speculation, of curiosity and vanity, deriving from an arrogant and uninspired approach to knowledge.[49] Curiosity and vanity are the products of a heart that is not humble, i.e. that doesn't have hope in God's illumination. So, the result of all these negative passions of the soul is the *oculus intellectualis extinctus* that Gerson quotes from Hugh of St. Victor; it is compared to the damaged physical eye described as infected.[50] Therefore, in the words of the chancellor, this coexistence of faith, illumination, and pure heart heals and repairs the mind that is now ready to abstract the principles from the knowledge deriving from all forms of perception; if even just one of these elements is missing, the intellectual eye is infected just like the *oculus carnis;* so, just like an infected part of the body, if not healed, it can become gangrenous and lose its natural faculty of seeing or touching or hearing or smelling, in the same way an *oculus intellectualis extinctus* is lost, or better, has lost the peculiar aspect that makes the human being different from all the other creatures, which is the divine sparkle of the mind enabling the *vis abstractiva* proceeding *a motu et materia*, not *cum motu et materia*, as we have seen earlier.

5. The forms of mental vision of God

Now, in the last part of my contribution, I intend to draw attention to how Gerson treats the mental vision of God (*visio Dei mentalis*) happening *in via* and its relationships with the "perceptive" and "intellectual" eyes. The author distinguishes between four kinds of mental visions of God: 1. *facialis et intuitiva;* 2. *specularis et abstractiva;* 3.

[49] Especially in the treatise *Contra curiositatem studentium,* the Parisian chancellor exposes his thoughts about curiosity, vanity, pride, and other intellectual attitudes seen as wrong and dangerous in the study of theology. Cf. Gerson, *Contra curiositatem studentium,* 244.15-18. For a general look at the concept of curiosity in the medieval thought, cf. Iribarren, "Curiositas", in *Mots médiévaux*, ed. I. Atucha, D. Calma, C. König Pralong, I. Zavattero, Turnhout 2011, 199-209; in particular 199: "Quel qu'en soit l'usage précis, en contextes médiévaux le terme *curiositas* est toujours marqueur d'une frontière … La curiosité est en ce sens une forme d'empiètement et sa dénonciation une forme de censure, une tentative de redresser l'ordre." Cf. G. Bös, *Curiositas. Die Rezeption eines antiken Begriffes durch christliche Autoren bis Thomas von Aquin,* Schöning 1995.

[50] Cf. *supra,* n. 42.

nebularis et aenigmatica; 4. *anagogica seu mystica*[51].

The first kind of vision of God (*facialis et intuitiva*) is described as possible for the angels and the human beings not by nature, but through an illumination that is gratuitous and, for this reason, it's also the rarest one.[52]

The second kind of vision of God, named *specularis et sincera*, is the vision directly, but not exclusively supported by the intellectual activity, because it consists of some kind of abstraction from what is known sensorially and intellectually, but is allowed by a special illumination of the grace (*lumen gratiae specialis*)[53] and by a moral order purifying the intellectual eye.[54] Gerson affirms about it that it can be acquired through the three theological virtues more than through the philosophical disciplines (*per solas philosophicas disciplinas*).[55] This is an important statement that can be fully understood under the light of other *loci* of the Gersonian works, where the author criticizes the excessive use of philosophical categories in the theological speculation, obnubilating the mind more than helping it.[56] The scientific knowledge (understood as natural philosophy, metaphysics, logic, etc.) is of course seen as a necessary step towards first the speculative and then the mystical theology, but this kind of knowledge has clear borders and becomes distorted if it's not driven by faith and by moral qualities like humility, but by curiosity and other distorted intellectual attitudes.[57] The sense of this passage is that the *visio specularis et sincera*, being a further abstraction of what the intellectual eye abstracts from the sensorial knowledge, is not possible if the philosophical knowledge deviates from the right path and surpasses its borders.

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[51] Gerson, *Tractatus de oculo,* ed. Glorieux, 152.29.

[52] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux, 152.35.

[53] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 153.16-13.

[54] Cf. Gerson, *Tractatus de oculo*, ed. Glorieux, 152.19-25.

[55] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux,153.19-25*:* "Visio Dei specularis et sincera longe facilius acquiritur per fidem, spem et caritatem cum vita conformi purificante mentis oculum, quam per solas philosophicas disciplinas acquiritur et post raptum, qualis esse potuit visio Pauli reflexa super actum quo intuitive vidit Deum; et a pulcherrima mulierum, etiam dum hic viveret, non videtur privilegium hoc abnegandum, quam a nullo illustrium Damascenus dicit vinci".

[56] Cf. Gerson, *De examinatione doctrinarum* 475.7; cf. Gerson, *Centilogium de causa finali,* 623.21-32, ed. P. Glorieux (Oeuvres complètes 9), Paris 1973.

[57] Cf. *supra*, n. 48.

The third kind of vision of God is defined as *nubilaris et aenigmatica* and is described as the one that the human being can obtain "through negation, in the way transmitted by Denys."[58] This kind of vision is allowed by a total detachment from the intellectual experience and by a voluntary deprivation of the intellectual light, in a dimension where no teaching and no learning take place, but the human soul immerses itself in the mystery of the Trinity.

Similar to this kind of vision is the *visio Dei anagogica.* Gerson affirms that this vision of God is obtained "through the mystical theology which teaches the ignorants, in an unlearned way, how to reunite under one obscurity, while love enters where cognition does not (*amor intrat ubi cognitio foris stat*[59])."[60] This is the mystical union of the human being with God, characterized by a form of teaching and learning which escapes the intellectual dimension.[61] In a letter to Barthélémy Clantier, Gerson explains that mystical and speculative theology are both necessary;[62] after the required speculative training, such a doctrinal knowledge must leave space to another form of learning, allowed not by the intellect but by love. The mystical union is a union of love and in fact, in the treatise *de oculo,* the kind of eye helping the human being to ob-

[58] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 153.43-44: "(Visio Dei nubilaris et aenigmatica) habetur etiam per viam abnegationis, modo qui traditur a Dionysio; quem ob hoc vocat tenebras atque caliginem quia fit per privationem sicut tenebra privationem lucis dicit". On Denys' negative theology, cf. J. N. Jones, "Sculpting God. The Logic of Dyonisian Negative Theology", in *The Harvard Theological Review* 89, 4 (1996), 355-371.

[59] Like for the *oculus intellectualis extinctus,* Gerson borrows this notion from Hugh of Saint Victor; cf. Hugo de Sancto Victore, *Super Hierarchiam Dionysii,* lib. 6, cap. 7, par. 1, ed. D. Poirel (CC CM 178), Turnhout 2015, 560.203: "Plus enim diligitur quam intelligitur, et intrat dilectio et appropinquat ubi scientia foris stat."

[60] Cf. Gerson, *Tractatus de oculo,* ed. Glorieux, 154.8-14.

[61] The idea of learning in an unlearned way is one of the pillars of the negative theology and will be the key of Nicholas of Cusa's *incomprehensibiliter comprehendere* of his masterpiece *De docta ignorantia,* harshly criticized by Johannes Wenck in his polemical *De ignota litteratura.* On Nicholas of Cusa, cf. G. Santinello, *Introduzione a Niccolò Cusano*. Roma 1971; cf. T. M. Izbicki and C. M. Bellitto (ed.), *Introducing Nicholas of Cusa: A Guide to a Renaissance Man*, New York 2008. On Wenck's *De ignota litteratura,* cf. J. Hopkins, *Nicholas of Cusa's Debate with John Wenck. A Translation and an Appraisal of De ignota litteratura and Apologia doctae ignorantiae*, Minneapolis 1981.

[62] Cf.Gerson, *A Barthélémy Clantier II,* 98.20-25, ed. Glorieux; 101.21-25.

tain the anagogical vision of God is the *oculus amoris*, described as one of the two eyes of the bride and the groom of the Canticle, where the other one is the *oculus intellectualis*;[63] another way to express a clear concept: cognition and love must go together in the path towards God.

6. Conclusions

Concluding, *Tractatus de oculo* offers not only the most accurate account of the visual perception and the notion of vision of God that we can find throughout the Gersonian works, but it represents a key for better understanding some statements that we find in other *loci* of the production of the Chancellor concerning the tight connection between the intellectual dimension of the human being, the impulse towards the search of God, and the moral aspects allowing both of them: the relationship between these three aspects is widely present in Gerson's thought. The way in which the Chancellor treats, in *De oculo,* the different forms of vision of God, constantly referring to the correct moral and intellectual approach needed, can be seen as a further reflection and a completion, coming in the last years of his life, of various considerations on topics that we fragmentary find in other treatises, as well as in letters like those addressed to Barthélémy Clantier, in which he criticizes the third book of Ruusbroec's masterpiece *Die geestelike Brulocht*.[64]

Tractatus de oculo can also be seen as an example of how an academic master, concerned by the need of doctrinal unity and by the necessity to avoid erroneous ideas, feels the duty to illustrate the conditions under which and the limits in which the vision of God is possible *in via*, but it seems evident that this comes after the attempt to illustrate the conditions under which and the limits in which the application of the mind to the objects of knowledge can be fruitful instead

[63] Cf.Gerson, *Tractatus de oculo,* ed. Glorieux, 154.8-14: "Visio Dei anagogica habetur per theologiam mysticam docentem ignotis ignote conjungi sub divina caligine, quamvis sine corporeo phantasmate, dum amor intrat ubi cognitio foris stat; sufficit oculo amoris quod oculus cognitionis praemonstraverit et dilectum suum etiam sub aenigmate fidei seu confusae visionis, qui posuit tenebras latibulum suum; quod subintrans amor dicit: et nox illuminatio mea in deliciis meis".

[64] Gerson, *À Barthélemy Clantier I*, ed. Glorieux 54-62. Gerson's criticism of Ruusbroec's work is studied in detail by A. Combes, *Essai.*

of dangerous.[65] This is why Gerson borrows from Hugh of Saint Victor the notion of *oculus intellectualis extinctus* and makes it central in a treatise on the visual perception and on the vision of God. For these reasons, this short, beautiful treatise, less known and studied than other Gersonian works, should be taken in the highest consideration within the studies on Gerson and, more in general, on the relationship between intellectual knowledge and spiritual dimension in the late Middle Ages.

University of Helsinki

[65] Cf.Gerson, *De mystica theologia*, ed. Glorieux, 272.30-34*:* "Sed tamen interim dicamus quod sicut cogitatio est improvidus animae obtuitus ad evagationem pronus, ita consequenter ad talem cogitationem, si sit de objecto delectabili, sequitur affectio improvida et vaga, sine utilitate et fructu; et haec mihi satis congrue videtur appellari libido seu cupido vel concupiscentia". On the notion of fruitfulness and usefulness of knowledge in Gerson's thought, cf. S. Grosse, *Aedificatio, fructus, utilitas. Johannes Gerson als Professor für Theologie und Kanzler der Universität Paris,* Tübingen 1986.

Part IV

Visio and experientia

Using Visual Conventions to Depict a Visionary Experience:

The Illustration of *Vision II* of Hildegard's *Liber divinorum operum* in Lucca Codex

Yael Barash

Introduction

Visualization works as a mediator in the visionary books of Hildegard of Bingen (1098–1179). Hildegard's miraculous experiences started with visual sights, which mediated intellectual content. The Lucca Codex contains Hildegard's last book, *Liber Divinorum Operum* (*LDO*), and each of its ten visions is illustrated.[1] The codex is dated to the first half of the 13th century,[2] around 50 years after Hildegard's death. The illustrations reconstruct Hildegard's original visions and therefore mediate Hildegard's visions to the viewers.[3] Moreover, this paper suggests that the illustrations ease the understanding of *LDO* by referring to familiar visual conventions. Thus, Hildegard's personal experience is translated into conventional forms.

Hildegard received divine visions from a young age before she joined a cloister at age eight.[4] At age 42, the divine voice ordered Hil-

[1] Codex 1942 in Biblioteca Statale of Lucca; 164 pages, 39X26 cm.

[2] A. Derolez, and P. Dronke, "Introduction", in Hildegardis Bingensis, *Liber divinorum operum* I, Vis, II. 2, ed. A. Derolez, P. Dronke (CCCM 92), Turnhout 1996, ciii; M Embach, *Die Schriften Hildegards von Bingen. Studien zu ihrer Überlieferung im Mittelalter und in der Frühen Neuzeit* (Erudiri Sapientia 4), Berlin 2003, 165.

[3] K. Suzuki, *Bildgewordene Visionen oder Visionerzälungen,* Bern-Berlin-Frankfurt-New-York, 1998, 242-5.

[4] According to her *Vita*, Hildegard received visions from a very young age and joined the monastery of Disibodenberg at the age of 8. Disibodenberg was mainly a male monastery with growing female residences: Theodericus, *Vita Hildegardis* I, 1, in *Vita sanctae Hildegardis, Leben der heiligen Hildegard von Bingen. Canonizatio sanctae Hildegardis. Kanonization der heiligen Hildegard von Bingen,* ed. M. Klaes,

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degard to make her visions public.[5] Hildegard used her divine experiences to authorize her theological writing, as an uneducated female.[6] In addition, she had to find a way to convey her personal visions forward – to find the right words to explain her miraculous sights, like all prophets seeking to convey their prophecies. In her texts, Hildegard reputedly documents her visions with the visual phrases "I saw" (*vidi*) followed by the audio phrases "I heard" (*audi*).[7] The audible documentation is a commentary of the visual documentation. Since the commentary came to her verbally, Hildegard could easily document it in quotes, unlike the visionary sights.[8]

Hildegard's texts were copied in her cloister, but only one codex, containing her first book *Scivias*, was illustrated. No illustrated codex of *LDO* from Hildegard's lifetime has survived. However, Rita Otto and Madeline Caviness suggest Hildegard illustrated a codex of *LDO*, or left illustrated wax tablets of it, which did not survive. They argue these illustrations influenced the design of the illustrations of Lucca

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Freiburg, 1998, 86; Hildegard Bingenis, *Epistolarium*, II, CIIIr, ed. L. van Acker (CCCM 91A) Turnhout 1993, 259.

[5] Hildegardis Bingensis, *Scivias,* "Protestificatio", ed. A. Führkötter, et A. Carlevaris (CCCM 43), Turnhout 1978, 3.

[6] B. Newman, *Sister of Wisdom,* Berkeley-Los-Angeles-London 1987, 8-9, 34; E. Gössmann, *Hildegard of Bingen: Four Papers*, Toronto 1995, 6; S. Flanagan, *Hildegard of Bingen 1098-1179: A Visionary Life,* London-New-York 1998, 52-4; A. Obermeier and R. Kennison, "The Privilege of Visio over Vox in the Mystical Experiences of Hildegard of Bingen and Joan of Arc", in *Mystical Quarterly* 23 (1997), 138; B.S. Rapp, "A Woman Speak: Language and Self-Representation in Hildegard's Letters", in *Hildegard of Bingen: A Book of Essays*, ed. M.B. McInerney, New-York-London 1998, 4. On the biblical tradition of authority based on prophecy and Hildegard see: C. Mews, "From Scivias to the Liber Divinorum Operum: Hildegard's Apocalyptic imagination and the call to reform", in *Journal of Religious History* 24 (2000), 48.

[7] M.J. Ortúzar Escudero, *Die Sinne in den Schriften Hildegards von Bingen*, Stuttgart 2016, 197.

[8] Through her career, Hildegard clarified that she is not the author of her texts, but only their documenter. However, through the commentary of *LDO*, the first-person pronoun is used sometimes for Hildegard. In Vision II, for example: "Quia ego anima fidelis hominis gressu ueritatis filium Dei, qui per humanitatem suam hominem redemit, secuta sum, introduxit me ille, qui cunctorum rector existit, in plenitudinem donorum suorum, ubi mnem saturitatem uirtutum inuenio et ubi de uirtute in uirtutem fiducialiter ascendo." Hildegardis Bingensis, *Liber divinorum operum* I, Vis. II.19, ed. Derolez et Dronke 78. For an analysis of the text of Hildegard's descriptions see: C. Barbetti, *Ekphrastic Medieval Visions*, New-York 2011, 120.

Codex.[9] Caviness even argues that Hildegard herself designed illustrations of the Lucca Codex.[10] A more likable suggestion would be that the makers of the Lucca Codex knew the illustrated codex of *Scivias* from Hildegard's lifetime. Keiko Suzuki argues that the differences between the codices and the design of the illustrations in the Lucca Codex suggest that the codex was made after Hildegard's death.[11]

Even if the makers of the Lucca Codex knew a lost codex, Hildegard still did not initiate or design the illustrations in the Lucca Codex.[12] The codex was made several decades after her death in a different Europe than Hildegard knew. The Beguines, Franciscans, and Dominicans originated then. The makers of Lucca Codex are actors who decided to copy the text of *LDO*, Hildegard's most intellectual book.[13] They showed erudition in the copy of the manuscript and decided to add expensive illustrations to the codex.[14] The illustrations are visual mediators to Hildegard's miraculous visual perceptions, as they try to follow her descriptions. The makers planted this mediation, even if they used older sketches. Thus, this paper will address the illustra-

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[9] R. Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", in *Mainzer Zeitschrift* 71-2 (1976), 110-126; M. Caviness, "Hildegard as Designer of the Illustrations to Her Works", in *Hildegard of Bingen: The Context of Her Thought and Art,* ed. C. Burnett and P. Dronke, London 1998, 35-37, 41.

[10] Caviness, "Hildegard as Designer of the Illustrations to Her Works", 37-39.

[11] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 252-3, 267-269, 276-277.

[12] I refer in the term "makers" to the illustrators, designers and patrons of the codex. See also: T. Martin, "Exception and Assumptions: Women in Medieval Art History", in *Reassessing the Roles of Women as 'Makers' of Medieval art and architecture,* ed. T. Martin, Leiden-Boston 2012, 2-7.

[13] Flanagan, *A Visionary Life,* 136; M. Zàtonyi, *Vidi et intellexi*: *Die Schriftthermeneutik in der Visionstrilogie Hildegards von Bingen,* Münster 2012, 132; G. Rabassó, "*In caelesti gaudio*: Hildegard of Bingen's Auditory Contemplation of the Universe", in *Quaestio* 15 (2015), 395-397.

[14] Derlorez and Dronke show how Lucca's scribes changed a separation between several sections in *LDO*'s Vision I, since their order did not match the order of the content of the vision. They state that Lucca "is the only codex in which an anomaly going back to Hildegard's lifetime was eliminated." Derlorez and Dronke also suggest that the illustrations were not copied, because the illustration of Vision II is the single one not located before the text of the vision. I would add the option that the makers were undecided about adding an illustration to each of the visions when they started to copy Vision II. Derolez and Dronke, "Introduction", cv-cvii.

tions as a visual reaction to Hildegard.[15] Thirteenth century theologians in Paris were engaged with the relation between personal experiences and authorial knowledge of a text.[16] The illustrations in the Lucca Codex combine these two options: they depict Hildegard's personal experiences and, therefore, the viewer personally sees her visions. The illustrations accept Hildegard's authority and thus present her information as an authorial text.

Scholars tend to believe the Lucca Codex was made during the attempt to canonize Hildegard due to the codex's expensive cost.[17] The canonization attempt was initiated by Pope Gregory IX during his first year in office.[18] The Pope asked clerics in Mainz to send him a record of Hildegard's' "history, way of life, reputation, merits, miracles, and in general all her circumstances."[19] The clerics received evidence from Bruno, the Guardian of St Peter in Strasbourg, to almost all of the asked sections, except miracles. Instead, Bruno told the clerics about signs (*signis*), and the clerics had to receive other evidence about the miracles.[20] Bruno added that he took Hildegard's visionary books with him

[15] For textual reactions to Hildegard through the 13th century, see: H. J. Schmidt, "Geschichte und Prophetie: Rezeption der Texte Hildegards von Bingen im 13. Jahrhundret", in *Hildegard von Bingen in ihrem historischen Umfeld,* hrsg. v. A. Haverkamp, Mainz 2000, 489-517; M. Embach, "Hildegard of Bingen (1098-1179): A History of Reception", in *A Companion to Hildegard of Bingen,* ed. B. M. Kienzle, D. L. Stoudt, and G. Ferzoco, Leiden-Boston 2014, 274-282, 292-298.

[16] A. Even-Ezra, *Ecstasy in the Classroom: Trance, Self, and the Academic Profession in Medieval Paris,* New-York 2019, 111-129.

[17] See for example: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca," 110; Caviness, "Hildegard as Designer of the Illustrations to Her Works", 34, 41; Embach, "A History of Reception", 299.

[18] "Canonizatio sanctae Hildegardis" 2, in *Vita sanctae Hildegardis, Leben der heiligen Hildegard von Bingen. Canonizatio sanctae Hildegardis. Kanonization der heiligen Hildegard von Bingen*, ed. M. Klaes, Freiburg, 1998, 244-246. Translation to English: "Acta inquisitionis", I, in *Jutta and Hildegard: The Biographical Sources,* ed. A. Silva, University Park, Pennsylvania 1998, 258-259. On the canonization attempt see: Embach, "A History of Reception", 279-230; G. Ferzoco, "The Canonization and Doctrization of Hildegard of Bingen", in *A Companion to Hildegard of Bingen,* eds. B. M. Kienzle, D. L. Stoudt, and G. Ferzoco, Leiden-Boston 2014, 305-307.

[19] "*Ipsius vita, conversatione, fama, meritis, miraculis, et generaliter de omnibus circumstantiis*." From: "Canonizatio sanctae Hildegardis", 2.3, 246. Translation to English: "Acta inquisitionis", I, 259.

[20] Most of the Clerics' report engages with evidence about miracles: "Canonizatio

to Paris, where he gave them to masters of theology to verify their authenticity. The masters confirmed the books came from the divine, and William of Auxerre gave the final stamp of approval.[21] After their report was completed, the clerics sent it back to the Gregory, who found it unsatisfactory. In 1233, he asked the clerics to elaborate, but they never completed their response. Hildegard was beatified and then declared a saint in 2012.[22]

The only scholar to suggest the codex not be attached to canonization is Keiko Suzuki. From her stylistic analysis, Suzuki argues the codex was made in the early 1220s, before the canonization was initiated in 1228.[23] She suggests it was made in Strasburg, as it combines German and French styles.[24] Referring to the same stylistic combination, Otto agrees the codex was made in the Rhineland. However, Otto proposes Trier as the most probable place based on paleographic evidence and the style of contemporary art objects from Trier.[25] Suzuki suggests Strasburg because Bruno of Strasburg was interested in Hildegard before the canonization was initiated.[26] Since Bruno was active in the process of canonization, other scholars do not contradict Bruno's involvement in the making of the Lucca Codex. Bruno's involvement in the making corroborates the choice of *LDO* among Hil-

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sanctae Hildegardis", 3-13, 248-264. Translation to English: "Acta inquisitionis", II-VII, 259-266.

[21] "Canonizatio sanctae Hildegardis", 14.8, 270. Translation to English: "Acta inquisitionis", VIII, 268-226 *Canonizatio sanctae Hildegardi* 9. On the visit to Paris see: Even-Ezra, *Ecstasy in the Classroom,* 3-5.

[22] Ferzoco, "The Canonization and Doctrization of Hildegard of Bingen", 307-308, 312-316.

[23] Suzuki quotes W. Sauerländer (*Von Sens bis Strassburg,* Berlin 1966, 140), who said that during the third decade of the 13th century, a byzantine style entered the Rhineland. Since the Lucca Codex does not have a byzantine influence, Suzuki indicates that it was made before 1230s: Suzuki, *Bildgewordene Visionen oder Visionerzälungen,* 282-283.

[24] Suzuki, *Bildgewordene Visionen oder Visionerzälungen,* 280-281.

[25] Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 124. The hand of the Lucca Codex appears also in a collection of Hildegard's letters (Berlin, Staatsbibliothek MS Lat. 4°674), with an early ownership mark from Trier: Derolez et Dronke, "Introduction", civ. In addition, some of the copping of texts for the canonization were probably made in Trier: Embach, *Die Schriften Hildegards von Bingen*, 384.

[26] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 254-256, 281-282.

degard's visionary texts since he was clearly interested in Hildegard's worldviews.

Analyzing the illustration of Vision II (fig. 1) in the Lucca Codex reveals visual conventions familiar to early viewers that therefore ease their understanding of the Vision. Thus, Hildegard's personal experiences were mediated to viewers through illustrated, visual conventions. The first section of this paper discusses visual conventions related to Vision II, which engages with a cosmological map; the second section suggests how the contemporary conventions of John in the Apocalypse affect the depiction of Hildegard's visionary experience.

A Visionary Cosmic Map

The readers of Vision II in *LDO*, including the makers of the Lucca Codex, find a complex description of the created cosmos and how God interacts with it. The focus on creation fits the evolving interest in nature in the 12th century.[27] Moreover, the information in Vision II resembles 12th century cosmic theories.[28] Actually, as we will see now, the vision includes an image of a cosmic map incorporating several conventions of maps. The makers of this illustration likely aspired to follow those instructions and combine the different conventions into one complex map. The references to visual conventions assist the makers of the Lucca Codex to follow the instructions, as the second part of this section will show.

Combination of Visual Conventions in Vision II of *LDO*

At first glance, one might find the fact that a vision of Hildegard includes conventions strange. As a miraculous and personal experience, Hildegard's visions were expected to be conceived as fully unique.

[27] G.B. Lander, "Term and Ideas of Renewal", in *Renaissance and Renewal in the Twelfth Century*, ed. R.L. Benson and G. Constable, Oxford 1982, 1-33; A. Speer, *Die Entdeckte Natur. Untersuchungen zu begründungsversuchen einer Scientia Naturalis im 12. Jahrhundert*, Leiden-New-York-Cologne 1995, 76-85.

[28] See also: Lander, "Term and Ideas of Renewal", 17; C. Mews, "Hildegard and the Schools", in *Hildegard of Bingen: The Context of he Thought and Art*, ed. C. Burnet and P. Dronke, London 1998; J.A. Strover, "Hildegard, the School, and Their Critics", in *A Companion to Hildegard of Bingen*, ed. B.M. Kienzle, D.L. Stoudt and G. Ferzoco, Leiden-Boston 2014, 109-111.

However, scholars have tracked intellectual influences on Hildegard since the beginning of modern research about her.[29] Nevertheless, many objects in Hildegard's visions are unique.[30] In *LDO,* which was written in a mature stage of Hildegard's career, scholars have found more textual influences.[31] This section suggests that in *LDO* the divine sights are also influenced by contemporary conventions. Hildegard could have seen cosmic maps when reading different cosmological texts affecting *LDO*.[32] It is reasonable to assume Hildegard had more encounters with intellectuals and their texts after the distribution of *Scivias*.

The first visual convention is of the divine figure that "contains" the cosmic map. The cosmos in the illustration is so big that it covers the frame of the illustrations. However, out of the cosmos peeks a (double-)head, hands, and at the bottom, the legs of a red figure.[33] The

[29] Hildegard quoted almost only from the Bible, and therefore finding her influencers is problematic. Scholars tried to suggest her sources from the first monograph about her: H. Liebeschutz, *Das allegorische Weltbild der Heiligen Hildegard von Bingen,* Leipzig 1930, 181-88. Dronke reacted to Liebeschutz in an article with the same name: P. Dronke, "The Allegorical World-Picture of Hildegard of Bingen: Revaluations and New Problems", in *Hildegard of Bingen: The Context of her Thought and Art,* ed. C. Burnett and P. Dronke, London 1998, 9-14; Dronke also did a lexical analyze on possible sources with Derolez: Derolez and Dronke, Introduction, xiv-xxiv. For intellectual influences see: A. Führkötter and A. Carlevaris, "Einleitung", in Hildegardis Bigensis*, Scivias,* ed. Führkötter and Carlevaris, xiv-xviii; Mews, "Hildegard and the Schools", 98-100.

[30] Between these unique sights one can mention a comparison between different souls to different kinds of cheese (Hildegardis*, Scivias* I*,* IV, 61); Flower of obedience, that Adam only smelled and did not eat in Original Sin (Hildegardis*, Scivias* II*,* I.8, 116-117); Lucifer attacking Ecclesia between her legs and making her bleed at the End of Times (Hildegardis*, Scivias* III*,* XI, 577.).

[31] Derolez and Dronke, "Introduction", xvii-xxii, xxxiv; G. Rabassó, "*In caelesti gaudio*", 396-398; Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 114-115.

[32] It is most probable that Hildegard came across intellectual texts: Derolez and Dronke, "Introduction", xix; Mews describes how Disibodenberg, Hildegard's first monastery, was active in books productions: Mews, "Hildegard and the Schools", 97. According to her *Vita,* philosophers visited her at Rupertsberg, her second cloister: Theodericus, *Vita Hildegardis* II.3 and II.12, in *Vita sanctae Hildegardis*, *Leben der heiligen Hildegard von Bingen. Canonizatio sanctae Hildegardis. Kanonization der heiligen Hildegard von Bingen*, ed. Freiburg, 1998, 130 and 156-158., 130 and 156-158.

[33] Suzuki, *Bildgewordene Visionen oder Visionerzählungen*, 215-216.

iconography of this "containing" figure was a novel in the 12th century and became common through the 13th century,[34] although it refers to old theological concepts.[35] Church Fathers used the verb *continere* to describe the relationship between God and the world.[36] For exemple Augustine suggested that God is always present in the world in its essence, in addition to His actions.[37] The new iconography depicts this complex relation: the whole cosmos is in God, Who is greater than the cosmos. In the commentary of *LDO*, these relations, as well as the roundness of the cosmos, are well explained:

> […] in scientia uere caritatis, que Deus est, forma mundi existit insolubiliter uolubilis […] Diuinitas etenim in prescientia et in opere suo uelut rota integra est et nullo modo diuisa, […] Et sicut circulus ea que intra ipsum latent comprehendit, ita sancta diuinitas infinite omnia comprehendit, ita sancta diuinitas infinite omnia comprehendit et superexcellit, […].[38]

> […] in the knowledge of true Love, which is God, the form of the world exists, indissolubly twisting, […] Indeed, in its foreknowledge and operation, divinity is like a wheel, whole and utterly undivided, […] And as a circle surrounds and contains all that lies inside of it, the holy divinity contains and exceeds all things infinitely, […]

An early example of the containing figure is found in *Tiberius Psalter* (11th century).[39] The illustration in *Psalter* also has attributes depicting God's involvement in the world: a scale in His hand depicts God as a judge at the End of Times; simultaneously, it refers to God as a creator, with a caliper in His hand and the separation of the waters in the circle

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[34] B. Orbist, "Wind Diagrams and Medieval Cosmology", in *Speculum* 72 (1997), 75.

[35] On the developments of divine attributes of place, from Philo and Rabbinic literature to Latin scholastics see: Y. Schwartz, "'*Ecce est locus apud me':* Maimonides und Eckharts Raumvorstellung als Begriff des Göttlichen" in *Raum und Raumvorstellung im Mittelalter,* ed. J.A. Aersten und A. Speer (Miscellanea Mediaevalia 25), Berlin-New-York 1998, 348-351.

[36] S. J. Grabowski, "God 'Contains' the Universe: A Study in a Patristic Theology", in *Revue de l'Université d'Ottawa* 26 (1956), 165.

[37] Augustinus, *Ep.* 187, 6.18*,* PL 33, Paris 1865, 838; Grabowski, "God 'Contains' the Universe", 171.

[38] Hildegardis Bigensis, *Liber divinorum operum* I, Vis, II.2, ed. Derolez et Dronke, 66; English translation in *The Book of Divine Works*, ed. N. M. Campbell (The Fathers of the Church: Mediaeval Continuation 18), Washington 2018, 54-55.

[39] London, British museum, Cotton MS Tiberius C VI, f. 7v.

of the cosmos (*Gen*.1.6-8). Moreover, God blows two trumpets, which might refer to His involvement in the creation or hint to the eschaton. A later example of God containing the cosmos occurs in an illustration of Peter of Poitiers' *Epitome historiae sacrae* (13th century).[40] Unlike the earlier example, the cosmos is depicted here as a wind map, and not during creation.[41] God appears without attributes, His feet peeking from below, like the illustration of Vision II in Lucca Codex.

The two faces of the figure in Vision II are an exception to the convention. *LDO* is the only occurrence where the containing figure has two heads: a gray-bearded face above a young one.[42] In the mentioned examples, *Tiberius Psalter* and *Epitome historiae sacrae,* God has only a single face. In *Psalter* God has a gray long beard and in *Epitome* the figure can remind of Christ. The two-faced figure firstly appears in Vision I (fig. 2) of *LDO*, where it appears without the round cosmos, holding a lamb.[43] The combination of the two faces and a lamb reminds the reader of the Trinity, but it actually emphasizes the Son. The Son appears both as a young man and as a lamb. The commentary of Vision I identifies the figure as *Caritas* (Divine Love), while emphasizing the divine fatherhood, not the whole Trinity.[44] The name *Caritas* also emphasizes the Son, as He did the ultimate loving act of self-sacrifice. Vision II starts with a description of how the cosmos feels *Caritas*' chest: "Then, upon the breast of the aforementioned image […], there appeared a wheel, wonderful to see, together with its signs and symbols."[45] The emphasis on the Son continues here: the Son is identified with *Logos* Who created the cosmos.[46]

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[40] Wien, Österreichische Nationalbibliotek, Ms. 378, fol. 1v.

[41] Orbist, "Wind Diagrams and Medieval Cosmology", 83.

[42] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. I.11, ed. Derolez et Dronke, 55.

[43] *Ibid*. As Suzuki mentioned, Hildegard did not mention the lamb in Vision II, and the illustrator decided to ignore it too: Suzuki, *Bildgewordene Visionen oder Visionerzählungen*, 214-215.

[44] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.1, ed. Derolez et Dronke, 59. Schipperges recognizes this figure as sign for the Son as the Second Adam: H. Schipperges, Kosmos Anthropos. *Entwürfte zu einer Philosophie des Leibes*. Stuttgart 1981, 245-247.

[45] Hildegardis Bigensis, *Liber divinorum operum* I, Vis, II.I, ed. Derolez et Dronke, 59; English translation: Hildegard, *The Book of Divine Works*, trans. Campbell, 46.

[46] See also: Suzuki, *Bildgewordene Visionen oder Visionerzählungen*, 216; Mews, "From *Scivias* to the *Liber Divinorum Operum*", 53.

The second visual convention depicted is the layered cosmos. *LDO*'s text identifies and explains each layer: In the middle of the cosmos, there is a globe; above it, there are different kinds of airs: thin air with clouds, strong-bright-white air, watery air, and above them, pure ether. Above them are two layers loaded with theological meanings: black fire, or the fire of judgment that punishes of the wicked, and the outer layer, a bright fire that signifies God.[47] God, as the One responsible to justice, also carries the area where the wicked are punished. Rings were common in cosmic maps. Already, at 818, a manuscript from Bede Venerabils includes illustrations of maps with rings. In folio 330, the cosmos is illustrated with a red outer layer, and the rings under it include figures of moons.[48] In another map in the manuscript, each ring is dedicated to one celestial body; the sun and the moon appear as personifications, and Mercury and Mars are shaped like stars.[49] *Liber Floridus* (1150-70) also depicts celestial rings, with stars in different sizes between them.[50] Those examples, unlike *LDO*, depict the sky without an additional theological meaning, and without separating different kinds of air.

The third visual convention affecting Vision II is wind maps. These maps present the twelve winds blown out of the twelve cardinal directions. In *LDO,* the winds are blown out of twelve animal masks, each placed in a specific direction: leopard blows from the east, lion from the south, wolf from the west, and bear from the north.[51] Each of the secondary winds is also depicted as an animal: stags are placed in east-south-east and east-north-east; lambs in south-east-south and north-east-north; serpents is placed south-west-south and north-west-north; and crabs in west-north-west and west-south-west. The animals were chosen according to their meaning: for example, lambs are secondary winds from the east, and serpents are opposite to them. The use of masks in wind maps was common throughout Europe, beginning in the

[47] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.I, ed. Derolez et Dronke, 59-60.

[48] München, Bayerische Staatsbibliothek, Clm 210, f. 330.

[49] München, Bayerische Staatsbibliothek, Clm. 210, f. 249.

[50] Wolfenbüttel, Cod. Guelf.1 Gud.lat. 4305, fol. 64v.

[51] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.I, ed. Derolez et Dronke, 61-63.

11th century.[52] However, except for *LDO*, the masks were of humans and not animals. For example, twelve frontal human masks blow in *Liber floridus* between clouds and twelve humans in profile blow in an illustration of Isidore's *De ventis* (late 12th century).[53]

Both in *Liber floridus* and *De ventis*, the twelve masks are placed with equal distances between each other. Likewise, according to *LDO*'s text, the distances between the animal masks are equal.[54] However, the secondary winds in the Lucca Codex are near the cardinal winds, so there are four groups of three winds.[55] After the 12th century, wind maps started to depict a hierarchy between cardinal and secondary winds.[56] For example, in the *Astronomy of Nimrod* (c. 1200), the four cardinal winds appear as a full-body personification, holding winged-human-masks of their secondary winds in both their hands.[57] Thus, the difference here between *LDO*'s text and the Lucca Codex might present a change in the convention of wind maps.

The rise of God's iconography as a containing figure affected wind maps. Winds started to be thought of as a power connecting God with the created cosmos. According to intellectuals in the 12th century, winds may originate in the created sky or in the divine.[58] As phrased in *LDO*:

> Et sicut uenti orbem terrarum uiribus suis tenent, ita etiam in officiis suis faciunt hominem scire et intelligere quid operates sit. [… uenti oriri] sed in superioribus elementis […], se tam sub terram quam super super terram dispergentes.[59]
>
> And as the winds hold together the globe of the earth with their powers, so too their duties to humans are to make them to know and understand what work they are supposed to do. [… the winds arise]

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[52] Orbist, "Wind Diagrams and Medieval Cosmology", 53.

[53] Ghent, Universiteitsbibliotheek, ms.92, f. 24r; Walters Art Museum, ms. W73, f. 1v.

[54] Hildegardis Bigensis, *Liber divinorum operum* I,Vis. II.I, ed. Derolez et Dronke, 61-63.

[55] Otto emphasizes the theological meaning of groups of three: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 114-115.

[56] Orbist, "Wind Diagrams and Medieval Cosmology", 83.

[57] Venezia, Biblioteca Marciana, Ms.lat.2760, fol. 2v. Derolez and Dronke suggest that *Astronomy of Nimrod* influenced *LDO*: Derolez and Dronke, "Introduction", xx-xxi.

[58] Orbist, "Wind Diagrams and Medieval Cosmology", 34, 74-75.

[59] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.24, ed. Derolez et Dronke, 85; English translation: *The Book of Divine Works*, 75.

> from the upper elements […], scattering themselves both below and above the earth.

Winds connect God and the cosmos according to the text and illustration of Vision II. Each group of three winds are blown out of a different layer with a different meaning, and each brings the meaning inward to the globe. The winds suggest how God both surrounds and enters everything, a relation that was not clear since Augustine.[60] The outer layer, which contains all other layers, is a red fire signifying God. The winds that are blown out of it cross all the layers and enter the globe. God surrounds and enters everything.

The fourth and last visual convention from *LDO*'s text is the figure of the naked man in the center of the cosmos. The hands and feet of the figure on a circle of air might remind viewers of the Vitruvian man, known mostly form Leonardo da Vinci's drawing.[61] Although the illustration has similarities in form, the ratio is quite different. According to Vitruvius, "if a man lies on his back, hands and feet outspread, and the center of a circle is placed on his navel, his figure and toes will be touched by the circumference."[62] According to *LDO*, the man's fingers and toes touch the circumference, but its center is not mentioned. The center in the illustration is the crotch.[63] Both Otto and Suzuki identify the man as the Second Adam.[64] The figure is naked as Adam before the Original Sin and his hands stretch like in a crucifixion.[65] However, it was uncommon in the high middle-ages to illustrate Christ crucified fully naked. The figure instead fits the visual convention of presenting man as a microcosmos.[66] Similar figures appear in *Commentary of Salomo*

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[60] Grabowski, "God 'Contains' the Universe", 177-186.

[61] Leonardo da Vinci Vitruvian Man, c. 1490, pen and ink with wash over metalpoint on paper, 34.6X25.5 cm, Galleria dell'Accademia, Venice.

[62] Vitruvius, *On Architecture*, III, c. 1, 3, trans. F. Granger, Cambridge Massachusetts 1962 (1931), 161.

[63] Suzuki suggests that the proportion of the figure follows proportions from *LDO*'s commentary: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 210-211.

[64] See Rom. 5.12-21.

[65] Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 114-115; Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 208.

[66] From the 13th century, naked figures in the same position appear in medical illustrations, which connects human physiognomy to astrological structures. For example: München, Hof- und Staatsbibliothek, cod.lat.19414, fol. 188v. On how this convention

of Constance (1165),[67] and in the now lost *Hortus deliciarum* of Herad of Landsberg (folio 16). In both, a naked man is surrounded by the four elements in the four corners. In *Astronomical Treatise* (1175-1200) the naked man is located between twelve wind masks.[68] In each example, the naked figure stands straight with his hands stretched sideways and slightly bent elbows, exactly like in the Lucca Codex. The meaning of a man as a microcosmos is deeply rooted in the commentary of *LDO*.[69]

Conventions and Illustrating the Lucca Codex

Conventions, by their essence, are more familiar to any contemporary audience than irregular objects. Correspondingly, the makers of the Lucca Codex easily follow the conventions Hildegard referred to, adding on them the irregular elements she mentions (for example, the animal mask and *Caritas*' two faces). As this section would suggest, the makers have difficulties following irregular details which do not connect to any conventions. Moreover, they recruit conventions unmentioned in *LDO* when the text leaves details out.

The first difficulty we will discuss concerns the ration between the layers of the cosmos. The commentary of Vision II explains that the shape of the map was chosen to precisely depict these rations. The circle shape was chosen instead of an egg shape, which was used in a previous vision in *Scivias*:

> Sed quod superdictum instrumentum [globus] in prioribus uisionibus tuis [Hildegardis] in figura oui denotatum est, hoc ostendit quod distinctio elementorum in eadem similitudine solummodo signifactur, quoniam mundo elementis distincto discretiua forma oui similtudini distinctionis ipsius, […]; hic autem in rota circuitio et recta mensura eorundem elementorum tatum ostenditur, cum neutrum ipsorum similtudinem figure mundi per omnia teneat, quoniam illa undique integra, rotunda, et uolubili exsistente […].[70]

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evolved out of the convention of depicting a man as a microcosmos see: C. W. Clark, "The zodiac Man in Medieval Medical Astrology", Ph.D. Dissertation at University of Colorado, Boulder 1979, 105, 283-284.

[67] München, Bayerische Staatsbibliotek, Cod. lat.13002, f.7v.

[68] Wien, Österreichische Nationalbibliotek, Cod.12600, f.29r.

[69] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.45, ed. Derolez et Dronke, 110-111.

[70] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.3, ed. Derolez et

> But when the instrument described above [the world] was laid out in your earlier visions in the shape of an egg, this was to show that only the division of the elements was signified in that likeness, because an egg's layers, […]. But now, the circumference and the correct proportions of these elements are shown only in a wheel, through neither of these holds a complete likeness of the figure of the world in every detail, because it exists everywhere whole, round, and whirling.

Although according to *LDO* the ration between the layers is important, the illustration does not reconstruct the rations. According to the description of Vision II, the width of the bright fire is two times the width of the black fire. The width of the pure ether is equal to the two fires combined (thus, three times the black fire). The width of the watery air is equal to the bright fire (two times the black fire), and the strong bright air is equal the width of the black fire. The width of the next layer, thin air with clouds, is equal to the sum of all the layers above it (nine times the black fire). The width of the globe is equal to the width of the thin air with clouds. Those ratios symbolize the Holy Trinity: The cosmos is divided into three equal layers of a globe, thin air with clouds, and the higher celestial levels. The higher celestial layers are also equally divided in three: fire, ether, and air.[71] The ration in the illustration is almost like the textual instruction but with curtail mismatches. The width of the pure ether is equal to the bright fire (two times the black fire instead of three), and the width of the thin air with clouds is only seven times the black fire instead of nine. The globe is approximately eight times the black fire. The Trinity, the reason for depicting the cosmos as circles instead of an egg, are absent from the illustration.

The illustrations only followed the description of the visions and not their commentaries, as Suzuki notices.[72] For example, the locations of the cardinal directions in Vision II are identical to Vision I, maybe since Vision II extends the Vision I. According to the description of Vi-

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Dronke, 66; English translation: *The Book of Divine Works*, 55.

[71] The text states that the two fires and two airs are united: Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.I, ed. Derolez et Dronke, 59-60. The number of layers also refer to the creation: The number of layers is equal to the number of creation days, as well as epochs: For the connection between the layers and the creation, as well as other symbols of numbers in *LDO*, see Otto: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 114-115.

[72] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 45. Suzuki leaves the option open that the creator read the commentary: ibid, 91.

sion I, *Caritas* stands in the south, while the animals on *Caritas'* wings look east (fig. 2).[73] Thus, in the illustration of Vision I and II, the top is south. The description of Vision II reports the locations of wind masks only in relation to *Caritas* and not by the cardinal directions. Only in the commentary are the masks identified by a cardinal direction. The leopard on the top is east and not south.[74] Thus, objects located by cardinal direction in the textual description are located according to the assumption that south is up in the illustration.[75]

Accordingly, depictions of the sun are misplaced. According to the description, the sun appears three times in the layer of black fire: The sun firstly appears above the naked figure, grouped with other six stars. "The sun, moreover, appears in its own circle [of black fire], at the side (toward the south) and also beneath the feet of that image [the naked figure]."[76] According to the directions in the commentary, south is on the right side of the folio. The makers however add the additional sun in the opposite side, where they thought south-east was. The makers do not locate the sun more south, since there they locate the first sun (above the head of the naked figure). The locations of the sun in the text refer to its daily route from east to west; but this reference is absent from the illustration. The additional sun is depicted between the leopard and the bear, northeast according to the commentary, where the sun never shines. Also, according to the cardinal directions of the illustration, the locations of the sun do not refer to the daily route: The sun under the feet of the naked figure is north according to the makers. The mismatch between the cardinal directions suggests the makers gave priority to the visionary description over conventions. East is at the top in most of medieval maps. The makers followed their understanding

[73] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. I.I, ed. Derolez et Dronke, 47. See also: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 55-56.

[74] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.17, ed. Derolez et Dronke, 75.

[75] Suzuki demonstrates it by the location of a golden line, which according to the text passes from east to west. Thus, it should had been over the naked man, while as it is illustrated perpendicular to him: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 56.

[76] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. II.32, ed. Derolez et Dronke, 93; English, 83. Suzuki, who did not notice that the sun repeats, suggests the additional suns were an artistic choice: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 68.

of Hildegard's text, missing the fact that the commentary followed the conventional directions.

The makers clearly try to follow *LDO*'s descriptions. However, in cases where the text leaves details out, the makers embrace non-mentioned conventions. Since there are no examples for it in Vision II, we will discuss details from the two following visions. Vision III emphasizes the movement of the celestial bodies. The text mentions a wind, which blows in the opposite direction from the winds that are mentioned in Vision II.[77] *LDO* states that the wind exits the outer fire, but does not mention any wind mask. The makers decide to illustrate a wind mask of a human like the convention in wind maps.[78] Another convention the makers refers to that is unmentioned in the text is calendars. The description of Vision IV discusses four airs and moistures that fall from the firmament on the globe and affect humans, animals, and plants.[79] The makers assign each a quarter of the globe (fig. 3). Small figures are placed on the globe, presenting the effects of the falling materials on them and on the globe. Similar characters are found in contemporary calendars presenting typical activities to each month. Some agricultural works in the calendar in *Psalterium ad usum ecclesiae Trecensis* (1175-1200) appear also in the illustration Vision IV:[80] reaping with sickle, mowing with scythe, and gathering fruits into a basket. Because of the reference to calendars, Otto identifies the four parts of the globe as the four seasons;[81] Suzuki goes one step further and suggests the illustration depicts the months February, March, April, June, July, August and October.[82] However, a close look at the figures and trees does not easily detect the seasons. Of the nine trees, only two are without leaves. The other trees have green leaves, and a couple of them in opposite sides carry fruits or flowers. Moreover, the reaping of the land appears before the naked trees, instead of right after them. The

[77] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. III.1, ed. Derolez et Dronke, 114.

[78] According to Otto, the concept of an opposite wind mask is unique to the Lucca Codex: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 116.

[79] Hildegardis Bigensis, *Liber divinorum operum* I, Vis. IV.1, ed. Derolez et Dronk, 137.

[80] Paris, Bibliothèque Nationale de France, Lat. 238, ff. 1r-6v.

[81] Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 116.

[82] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 63, 73-74.

makers might have used conventions from calendars only because they, not he preferred to use familiar conventions.[83]

Framing the visions

The depiction of the visionary cosmic map has a stunning golden background. Under the map, in the left bottom corner of the illustration, a figure of Hildegard sits and observes her vision. Hildegard is depicted as a mediator between the divine cosmological knowledge and the viewer.[84] Similar figures of Hildegard appear in each of the ten illustrations of the Lucca Codex, presenting her authority on the miraculous knowledge. Her depiction follows the visual conventions of John in the Apocalypse, but this was overseen until now.[85] Apocalypses from the 13th century depict John more frequently than ever before.[86] Both Hildegard and John are depicted next to their visions, maybe to show the viewer the visions as the prophets had.[87] This is reflected also in their texts by the frequent use of the phrase "I saw…" to remind their readers of their mediation.[88]

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[83] Suzuki, who discussed the influence of calendars on the illustration, suggests that calendars were chosen to convey the change between the materials: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 74, 107.

[84] See also Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 248.

[85] Suzuki compares the figure of Hildegard to other prorates of authors near holy figures, but I find this comparison less fruitful than the one to John: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 246-247, 250-251.

[86] This is true mostly for apocalypses from England, but not limited to the inland: S. Lewis, *Reading Images: Narrative Discourse and Reception in the Thirteenth-Century Illustrated Apocalypse*, Cambridge 1995, 20.

[87] For the influence of Aristotelian theory of causality on the presentation of John see: Lewis, *Reading Images*, 21, 23-25. On how Hildegard's location near her visions show the objectivity of the visions see: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 249.

[88] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 250; C. Meier, "*nova verba prophete*: Evaluation und Reproduktion der prophetischen Rede der Bibel im Mittelalter. Eine Skizze", in *Prophetie und Autorschaft: Charisma, Heilsversprechen und Gefährdung*, hrsg.v. C. Meier and M. Wagner-Egelhaaf, München 2014, 89. For a thorough comparison of Hildegard's books and the Apocalypse, see: Mews, "From *Scivias* to the *Liber Divinorum Operum*", 46-47.

All the figures of Hildegard in the Lucca Codex document their visions on wax tablets. The fact that she documents the vision while perceiving it indicates the vision was correctly conveyed and therefore true. Figures of John in apocalypses also document their visions while perceiving them.[89] In Bamberg Apocalypse (c.1001) and Morgan Apocalypse (1255-60), John is writing on a parchment when the angel orders him to write.[90] In another folio of the Morgan Apocalypse, John stands and writes the text of the apocalypse to the readers of the codex itself.[91] In Getty Apocalypse (1255-60), the angel even gives John a pen when ordering him to write.[92] Hildegard mentions in the prolog of *LDO* that she received an order to document the visions, and she documented them while perceiving them:

> [uox de celo Hildegardem:] que interioribus oculis uides et interioribus auribus anime percipis, stabili scripture ad utilitatem hominum commenda […]. Itaque scribe ista non secundum cor tuum, sed secundum testimonium meum, qui sine initio et fine uita sum, […]
>
> Ego igitur […] testificante homine illo, quem, uelut in prioribus uisionibus meis prefata sum, occulte quesieram et inueneram, testificante etiam eadem puella cuius in superioribus uisionibus mentionem feci, quamplurimis infirmitatibus contrita manus tandem ad scribendum tremebunda counerti. Quod dum facerem, sursum ad uerum uiuensque lumen aspexi quid scribe deberem;[93]
>
> [Voice from heaven to Hildegard:] Commit to fixed writing these things that you see with the inner eyes and perceive with the inner ears of the soul, to be useful for humankind […]. Write them indeed not according to your own heart, but according to my testimony, I Who am without beginning or end. […]
>
> Therefore, I […] have at last turned my trembling hands to writing. This is witnessed by the person whom I had sought and found in secret, as I have related in my previous visions; it is also witnessed by the girl of whom I made mention in my most recent visions. As I have done this, I have looked up to the true and living light to see what I ought to write.

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[89] Lewis, *Reading Images*, 19-20.

[90] Bamberg, Staatsbibliothek. Misc. Bibl. 140, f. 9r; New York, the Morgan Library and Museum, ms. M.524, f. 13r.

[91] New York. TML, MS M.524, f. 13r.

[92] Los Angeles, The Getty Museum, Ms. Ludwig III 1 (83.MC.72), f. 15r.

[93] Hildegardis Bigensis, *Liber divinorum operum* Prologvs, ed. Derolez et Dronke, 45-46; English translation: *The Book of Divine Works*, 30-31.

As Hildegard describes, all her figures in the Lucca Codex turn their faces up with their eyes open.[94]

The witnesses mentioned by Hildegard in *LDO* appear in the first illustration of the Lucca Codex (fig. 2).[95] The girl stands behind Hildegard who sits.[96] On the other side a monk, recognized as Hildegard's assistant Volmar, sits in a separated space. Volmar accompanies Hildegard also in the author's portrait in the Rupertsberg Codex, which was made during Hildegard's lifetime.[97] In both illustrations, Hildegard documents her vision on an erasable wax tablet while Volmar writes her message on permanent parchment. Volmar sits in a different room in both illustrations, but in the earlier, he manages to peek at Hildegard through a thin jamb. In the Lucca Codex they are fully separated by a thick wall. I would suggest that the architectural structure, including the separation, demonstrates Hildegard's enclosure.[98] Enclosure became an important virtue for nuns during the 13th century, in light of the Mendicant monks who exist the monastery walls.[99] This change might also explain the enclosure of the figure of Hildegard by an architectural structure in each illustration in the Lucca Codex.[100] The structures separate Hildegard from her visions, unlike the illustrations of John.

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[94] See also Caviness, "Hildegard as Designer of the Illustrations to Her Works", 39; Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 112.

[95] See also: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 251.

[96] Some scholars have recognized her as Richardis, a nun who helped Hildegard during the work on *Scivias*. Embach recognized that it cannot be, since Richardis died already in 1152: Embach, *Die Schriften Hildegards von Bingen,* 117n1.

[97] Rupertsberg Codex (now lost), fol.1r. On the comparison of the two illustrations, see: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 111; Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 190.

[98] Caviness suggests that the structure in *LDO* is more respectful: Caviness, "Hildegard as Designer of the Illustrations to Her Works", 39.

[99] In 1220s–1230s Clara of Asisi unsuccessfully fought for the right to leave the cloister in order to live a poor life like male Franciscans: J. Mueller, *A Companion to Clare of Asisi: Life, Writing and Spirtuality* (Brill's Companions to the Christian Tradition 21), Leiden-Boston 2010, 67-77; C. M. Mooney, *Clare of Assisi and the Thirteenth-Century Church: Religious Woman, Rules and Resistance*, Philadelphia 2016, 67-79; E. Northcutt, "The Battle for Poverty: Pope Gregory IX against Saint Clare of Assisi", in *Magistra* 24 (2018), 13-18.

[100] Also in the other illustrated codex of Hildegard from the 13th century, Hildegard appears enclosed: Heidelberg, Universitätbibliothek, Cod. Sal. X16, f. 3v.

Another attribute appearing in the illustration of Vision I (fig. 2) but not in the following illustrations is flames breaking from above and touching Hildegard. The flames are not mentioned in *LDO*'s Prolog, nor in Apocalypses, but they are mentioned in *Scivias*' exposition text and its illustration in the Rupertsberg Codex.[101] Thus, the makers of the Lucca Codex know either *Scivias*' text or the earlier illustrations. In the Rupertsberg Codex, the flames start under the top frame, enter Hildegard's face, and touch her sensory organs. In the Lucca Codex they only touch the outer line of her face and exit a window inside clouds in the top frame. The top frame that Hildegard and her earthly companion stay in is the bottom frame of the sights of Vision I. The window connects the two spaces.[102]

The attribute of a window does not appear in Hildegard's texts but is found in contemporary Apocalypses' illustrations. In the Morgan Apocalypse, the angel points to John through a long window to see Christ and the elders between the four animals.[103] In the Getty Apocalypse, windows appear in the frames of different illustrations when John stands in the *marginalia,* peeking into the divine sight.[104] In folio 7v, an eagle flies in the direction of the window, out to John.[105] In the Toulouse Apocalypse (1220-70) John pulls an elder through a door leading to Christ and the four animals.[106] Windows keep appearing also in other folios of the Toulouse Apocalypse, some inside clouds.[107] In each of these examples, windows connect different levels of realities.[108]

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[101] Hildegardis Bigensis, *Scivias,* Protestificatio, 4.

[102] Suzuki argues that the depiction of the introduction with Vision I ease the reading of the Vision: Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 191-192.

[103] New York, the Morgan Library and Museum, ms. M.524, f. 1v.

[104] Los Angeles, Paul Getty Museum, Ms. Ludwig III 1, ff. 13v, 31v, etc.

[105] Los Angeles, Paul Getty Museum, Ms. Ludwig III 1, f. 7v.

[106] Toulouse, Bibliothèque Municipale, Ms. 815, f. 9.

[107] Toulouse, Bibliothèque Municipale, Ms. 815, ff. 36r, 33v.

[108] R. K. Emmerson, "Visualizing the Visionary: John in his Apocalypse", in *Looking Beyond: Visions, Dreams and Insights in Medieval Art and Thought*, ed. C. P. Hourihane (Index of Christian Art Series), Princeton and University Park 2010, 156; P. Klein, "Visionary Experience and Corporeal Seeing in the Thirteenth-Century English Apocalypses: John as External Witness and the Rise of Gothic Marginal Images", in *Looking Beyond: Visions, Dreams and Insights in Medieval Art and Thought*, 182.

Hildegard appears with her earthly companions only in Vision I. As mentioned, Hildegard sits in the bottom corner in Vision II. She appears again in the corner of the illustrations in Visions III-VI. Hildegard is located in separated spaces (like in Vision I) in Visions VII, VIII and X. The window does not return; instead, Hildegard manages to look through the frame.[109] In Vision IX, Hildegard is placed again in the corner of the frame, but here a thin green frame separates her. In each illustration, the background of the visions and Hildegard is gold, like in illustrations of the Bamberg Apocalypse (c.1001).[110] John changes his location in relation to his visions too. Moving enables him to convey his vision to his audience.[111] In the Bodleian Apocalypse (first half of the 12th century), John appears in fol. 6 in the right side with his head covered by a winged animal. In the next folio (fol. 7), John appears at the bottom of the illustration, separated by the color of the background.[112] Two similar scenes are depicted on a folio of the Toulouse Apocalypse, with angels sounding the third and fourth trumpets (*Rev*.8.10-12). John stands behind the angels, separated by the color of the background in the illustration of the third trumpet, and the two share the background in the fourth illustration.[113] As mentioned, John stands in the *marginala* of some of the folios in the Getty Apocalypse, but he also enters the visionary space in other folios.[114]

The makers of the Lucca Codex took another convention from apocalypses: a scroll. In many apocalypses, John receives a scroll, symbolizing him receiving the divine information. In Valenciennes Apocalypse (early 9 century), a divine hand exits a cloud and delivers John a scroll with seven seals.[115] In other cases, the scroll appears in the scenes

[109] Suzuki, *Bildgewordene Visionen oder Visionerzälungen*, 111.

[110] Bamberg. Staatsbibl., Misc. Bibl. 140. For more on the meaning of the gold and other colors in Lucca Codex see: Otto, "Zu den gotischen Miniaturen einer Hildegardhandschrift in Lucca", 111.

[111] Lewis, *Reading Images*, 21, 23.

[112] Oxford, Bodleian Library, MS. Bodl.352, f.6r, 7r.

[113] Toulouse, BMT, MS.815, f.16r.

[114] John in the *marginalia:* Los Angeles, Getty, MS. Ludwig III 1, f.7v, 13v, 31v, etc. John in the visionary space: f.15r, etc. See also: Klein, "Visionary Experience and Corporeal Seeing", 182.

[115] Valenciennes, Bibl. Mun, 99, f.3r.

John writes.[116] In the Bamberg Apocalypse, the angel brings a scroll to John who holds an open book and pen;[117] in the Getty Apocalypse, the angel brings John a scroll together with a pen.[118] The scrolls tell John and Hildegard what to write, as they obey the order to document their visions. The makers of the Lucca Codex decide to add the scroll after two illustrations were already completed.[119] A white scroll was painted over the gold background of the illustrations of Vision I and II (fig. 2 and 1). Moreover, these scrolls start next to the hand of *Caritas*, but he does not hold it. However, in most of the following illustrations, scrolls take an eminent part. In the illustration of Vision IV (fig. 3), a divine hand exits the fire, sending a scroll toward Hildegard; in Vision IX, the divine hand exits a cloud, as in the Valenciennes Apocalypse.

All the attributes in the Lucca Codex that are conventional in the Apocalypses refer to the documentation of visions. Other themes in the description of John are not used. For example, Hildegard does not react to the visionary events as John does, perhaps because Hildegard seldom shares her thoughts.[120] Moreover, some contemporary apocalypses include a biography of John or an illustration of him distributing his Apocalypse.[121] None of this appears in illustrations of Hildegard, who always appears while perceiving her visions and never concerning her virtues or miracles. However, Hildegard's witness can be understood as higher than John's. In many illustrations, John is accompanied by an Angel.[122] The angel points to images and tells John what to look at. In the Morgan Apocalypse, the angel even carries John in his arms through the visionary sights.[123] Hildegard

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[116] Emmerson, "Visualizing the Visionary: John in his Apocalypse", 157.

[117] Bamberg. Staatsbibliothek, Misc. Bibl. 140, f. 9r.

[118] Los Angeles. Getty, Ms. Ludwig III 1 (83.MC.72), f.15r.

[119] See also: Caviness, "Hildegard as Designer of the Illustrations to her Works", 40-41.

[120] Emmerson, "Visualizing the Visionary: John in his Apocalypse", 162; Lewis, *Reading Images*, 20.

[121] Emmerson, "Visualizing the Visionary: John in his Apocalypse", 169-171; Lewis, *Reading Images*, 25-28, 34.

[122] Bamberg, Staatsbibl. Misc. Bibl. 140, f.13v. Oxford, BL. Bodl. 352, f.7r; New York, ML, M.524, f.1v, 21r. See also: Emmerson, "Visualizing the Visionary: John in his Apocalypse", 166; Klein, "Visionary Experience and Corporeal Seeing", 180-181.

[123] New York, ML, M.524, f.16v.

does not need any companion or mediator; she mediates her visions directly to us.

Conclusion

Divine visions utilizing conventions are more familiar and therefore easier to understand. This paper suggests that Hildegard's description of Vision II combines visual conventions of her era into a unique, complex map. The makers of the Lucca Codex use these conventions when reconstructing the textual description into an illustration of a visionary, cosmological map. The makers have difficulties following the text when it did not follow conventions. Moreover, the makers refer to other conventions in cases where the text left details out, including in the depiction of visionary experiences. The makers convey the visionary characteristic by depicting Hildegard in each illustration. They adopt attributes from the figure of John in the Apocalypses to frame the cosmic map as visionary divine knowledge, like in the Apocalypse. The makers, who illustrated Hildegard's matured visions of *LDO* around fifty years after her death, present the visionary content and experience with familiar conventions.

Cohn Institute, Tel Aviv University

Fig. 1.

Fig. 2.

Fig. 3.

Through the Mirror. (Super-)natural Properties of Reflecting Surfaces in 13th-Century Scientific and Theological Thought

Francesca Galli

> Sono i specchi di tre maniere: l'una maniera sono ispecchi tondi, e questo usiamo tondi, e rappresenta la cosa minore che non è. Un'altra maniera è di specchi piani, e questi rappresentano la cosa così grande com'ella è; il terzo ispecchio cavo, e questo rappresenta la imagine a ritroso, come'l topazio, credo che disse. E la ragione di ciò è questa: chè dicono i santi che la sua natura, il suo crescere, va a ritroso. E dovete sapere che ogni maniera di specchio vuole essere purissimo, altrimenti non mostrerebbe neente.[1]

Contrary to what one might believe, the above excerpt is not taken from a student handbook or an encyclopaedia. Instead, it is part of a vernacular sermon delivered on the 2nd of February 1303, in Santa Maria Novella (Florence), by Giordano da Pisa. The occasion is the feast of the Purification of Mary and the well-known Dominican preacher is commenting on *Lc,* 2:22. To talk about purity, Giordano chooses to start from a concrete example, that of mirrors, in order to then move on to spiritual meanings and moral instructions. He dwells on reflective surfaces and their properties, identifying three types of mirrors: plane, convex and concave. In the first one, the image is the same size as the object and the same way up; in the second, it is reduced in size and upright, while in the third the image is inverted (unless the object is placed beyond the focal point) and reduced or magnified depending on the position of the real thing. After a brief 'scientific' foreword, the Dominican compares the immaculate Virgin to a spotlessly clean mirror – for she reflects divine light more than any other creature. Giordano

[1] *Prediche inedite del B. Giordano da Rivalto dell'Ordine de' Predicatori. Recitate in Firenze dal 1302 al 1305,* a cura di E. Narducci, Bologna 1867, 35 (VII). On the author and his work, see at least C. Delcorno, "Giordano da Pisa", in *Dizionario biografico degli italiani*. https://www.treccani.it/enciclopedia/giordano-da-pisa(Dizionario-Biografico)/ (accessed: 15.11.2021).

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specifies that Mary is similar to a round or spherical mirror, since this is the geometric form of perfection, in which there is nothing in excess or lacking. At the same time, the Virgin is somehow like a concave mirror because of her profound humility. Besides, she concurrently gathers the properties of all reflecting surfaces. Christ incarnate is perfect, like the reflection in a flat mirror, and in his earthly dimension is simultaneously God and man. On the other hand, when his mother embraced him as her newborn child, the human God, so to speak, was 'upturned' and 'downsized' in terms of his divine power. Lastly, Giordano adds that, just as mirrors are cold but become warm and reflect heat when exposed to the sun, even to the extent of igniting wood, so did Mary receive and multiply the divine light in herself, becoming a model of ardent charity.

From a certain point of view, Giordano's way of structuring and presenting his reasoning appears consistent with that of many other contemporary authors. Indeed, analogies and detailed comparisons between the physical world and the supernatural dimension are widely acknowledged as some of the means of communication that medieval theologians and preachers – but also poets – adopted in order to convey their thoughts and teachings. Furthermore, mirrors are undoubtedly among the objects whose symbolic meaning is extensively exploited,[2] already in the Bible – let us think of Paul's "videmus nunc per speculum in aenigmate" (I *Cor*, 13:12) – and in the Church Fathers' writings. However, in the aforementioned sermon – but this also applies to many other of his homilies –[3] the learned Dominican does not restrict himself to generic references and images. On the contrary, Giordano deploys notions, theories and technical terms that belong to the field of optical

[2] The bibliography on this subject is vast. See *The Mirror in Medieval and Early Modern Culture. Specular Reflections*, ed. N. M. Frelick, Turnhout 2016 (esp. the contributions by A. Dysert, D. Napolitano, S. Conklin Akbari); L. Licka, "What is in the Mirror? The Metaphysics of Mirror Images in Albert the Great and Peter Auriol", in *The Senses and the History of Philosophy*, ed. B. Glenney, J. Silva, London 2019, 131-148. Very relevant to the present contribution is also H. L. Kessler, "Speculum", in *Speculum* 86 (2011), 1-41.

[3] See, e.g., *Prediche inedite del B. Giordano da Rivalto*, 105-106 (XIX); Giordano da Pisa, *Quaresimale fiorentino 1305-1306*, a cura di C. Delcorno, Firenze 1974, 395-6. See also G. Ledda, "Filosofia e ottica nella predicazione medievale", in *Letteratura in forma di sermone*, a cura di G. Auzzas, G. Baffetti, C. Delcorno, Firenze 2003, 53-78.

science and is willing to use this knowledge while sharing the Christian message with a wide and varied audience, which is not necessarily well-educated or fluent in Latin.

For fifty years now, important studies in the history of science, philosophy, art and literature have shown that optics played a pivotal role in medieval culture and society, especially between the 13th and the 15th centuries.[4] Lindberg defines it as "the most fundamental of the natural sciences, the key that would unlock nature's door,"[5] since it allows its practitioners to investigate the transmission of rays and *species* (e.g., angles of reflection and refraction, and the other phenomena that can be determined by means of what today we call geometrical optics), and therefore accounts for all causal relationships and, together with anatomy, for the functioning of all senses (not only sight). Moreover, optical theories constitute a model for understanding learning mechanisms – Lindberg speaks of the "epistemology of light" –[6] and the "theology of light" is at the centre of heated controversies among the most renowned theologians of the time, including Bonaventure and Thomas Aquinas. Finally, the beauty of the object – let us think, just to give an example, of the effects of solar rays on coloured glass and mirrors – leads to the development of various "aesthetics of light."[7] As a consequence, very soon *perspectiva* and optics[8] begin to be employed far beyond their well-defined boundaries, becoming a paradigm in contemporary imagery.

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[4] Since the bibliography on the subject is copious, in the following notes I will limit myself to recalling only some of the contributions which are most relevant from my research perspective.

[5] D. C. Lindberg, *Theories of Vision from Al-kindi to Kepler*, Chicago 1976, ix. Along with Lindberg's fundamental handbook, on the history of optics see at least the pioneering volume by G. Federici Vescovini, *Studi sulla prospettiva medievale*, Torino 1965 and the recent A. M. Smith, *From Sight to Light*, Chicago 2014.

[6] Lindberg, *Theories of Vision,* 95 (here the author distinguishes between the theology, epistemology and aesthetics of light). See also K. H. Tachau, *Vision and Certitude in the Age of Ockham*, Leiden-New York 1988.

[7] For a broad introduction to the topic, see E. De Bruyne, *Etudes d'esthétique médiévale*, vol. IV, Bruges 1946.

[8] On the distinction between optics and *perspectiva* (i.e., geometrical optics), see esp. C. Panti, "The Oxford-Paris Connection of Optics and the Rainbow", in *Les Sciences au Moyen Âge (XIIIe-XVe siècle). Autour de Micrologus*, *éd.* D. Jacquart et A. Paravicini Bagliani, Firenze 2021, 251-280.

In this contribution I will concentrate on medieval optics as a source of visual pastoral tools.[9] What I intend to show is how technical notions and theories about light and vision – according to which medieval scholars explain how physical phenomena are visible and can be perceived – are often used to represent immaterial experiences, to convey spiritual truths, and also to make complex theological concepts and precise moral directives more fascinating, accessible to unlearned people, and easier to remember. As this is such a broad subject, I intend to focus especially on writings by 13th-century *perspectivi* and/or by authors who work closely with these masters. I will analyse select similes concerning optical phenomena, and particularly light reflections and mirrors, occurring in coeval sermons, manuals for prelates, and moral treatises.

Robert Grosseteste's *Dicta*

Robert Grosseteste is somehow considered the 'father' of Western optics, despite the fact that, unlike Roger Bacon, he had at his disposal only some of the most important treatises from the Greek and Islamic optical tradition, excluding, for example, Alhacen's *De aspectibus*.[10] His teachings and legacy profoundly influenced Franciscan masters and students in Oxford in the mid-13th century and later in Paris, even if we cannot probably speak of any real 'school' or disciples.[11]

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[9] I began to investigate this topic, especially with regard to 13th-century Franciscan authors, in F. Galli, *Il 'De luce' di Bartolomeo da Bologna. Studio e edizione*, Firenze 2021, 47-85. In addition to the contributions mentioned in the following notes, see D.G. Denery II, *Seeing and Being Seen in the Later Medieval World: Optics, Theology, and Religious Life*, Cambridge-New York 2005, and the recent A. M. Smith, "The Roots and Routes of Optical Lore in the Later Middle Ages and Renaissance", in *Perspective as practice. Renaissance cultures of Optics*, ed. S. Dupré, Turnhout 2019, 241-258.

[10] Lindberg, *Theories of vision*, 94-103. See also D.C. Lindberg, "Lines of Influence in Thirteenth-Century Optics: Bacon, Witelo, and Pecham", *Speculum* 46/1 (1971), 66-83; and Smith, *From Sight to Light*, 260-275.

[11] J. McEvoy, *The Philosophy of Robert Grosseteste*, Oxford 1982, 451. Concerning the connections between the Oxonian and Parisian milieus, see the recent Panti, "The Oxford-Paris Connection", and J.M.G. Hackett, "From *Sapientes antiqui* at Lincoln to the New *Sapientes moderni* at Paris c. 1260–1280: Roger Bacon's Two Circles of Scholars", in *Robert Grosseteste and the Pursuit of Religious and Scientific Learning in the Middle Ages*, ed. J.P. Cunningham, M. Hocknull, Cham 2016, 119-142. The

In Grosseteste's theological and pastoral writings we already find many examples of the spiritualisation of objects and phenomena related to light and optics. In this regard, several works by the future Bishop of Lincoln could be taken into consideration, e.g., the scientific-geometric exegesis[12] in his *Hexaëmeron* or in the *De operationibus solis*, where he comments on the book of *Sirach*, but also his allegorical poem in the vernacular, the *Château d'Amour*. Since they have hardly been studied from this perspective[13] and contain much interesting material, the present analysis will focus on Grosseteste's *Dicta*, a collection of 147 notes of various length on moral and religious topics. These texts, which range from short sketches to long sermons, were probably composed around 1230 and later brought together.[14]

In *dictum* 44, a lengthy explanation is devoted to the word "lucerna", lamp, which occurs in the gospel of John (5:35): "John (the Baptist) was a lamp that burned and gave light". At the beginning, John the Baptist himself, along with all other saints, is described as a lamp, something which enlightens other things but is not a source of light itself. Predictably, a comparison with Christ, the Sun of justice and the origin of every kind of spiritual illumination, immediately follows, but a detail is added to this commonplace. As for natural light, Grosseteste explains that both spherical glasses (i.e., suitably shaped burning glasses) and concave mirrors can be used to start a

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collective volume edited by Cunningham and Hocknull provides an overall framework for the topics covered in this section.

[12] Due to space constraints, I have chosen not to dwell on the subject of 'scientific exegesis' in this paper. See the contributions by Panti (143-164) and Gasper (221-242) in the volume mentioned in the previous note (n. 11). See also D. Jacquart, "*Perspectiva* et exégèse biblique franciscaine aux XIIIe et XIVe siècles: un recours problématique?", in *Micrologus*, 29 (2021, *Arabic and Latin Theory of Perspective*), 157-180.

[13] But see C. Casagrande, S. Vecchio, "Alle origini dell'ottica morale", in *Edizioni, traduzioni e tradizioni filosofiche (secoli XII–XVI)*, a cura di L. Bianchi, O. Grassi, C. Panti, vol. I, Roma 2018, 35-47; C. Panti, "Scienza e teologia agli esordi della scuola dei Minori di Oxford: Roberto Grossatesta, Adamo Marsh e Adamo di Exeter", in *I francescani e le scienze*, Spoleto 2012, 321-25.

[14] J. W. Goering, "Robert Grosseteste's *Dicta*", in *Robert Grosseteste and his Intellectual Milieu*, ed. J. Flood, J. R. Ginther, J. W. Goering, Toronto 2013, 64-87. For the text of the *Dicta*, I always refer to the "working edition" prepared by J. W. Goering and E. J. Westermann in 2003, now available on the website of the research project *Ordered Universe*: https://ordered-universe.com/dicta/ (accessed: 10.10.2021).

fire. Then he remarks that Christ in his divinity is like the sun, whereas in his humanity he is similar to a round, pure, transparent stone, with no trace of earthly filth. Accordingly, the Son can in some way concentrate his own divine rays onto a single point, and thus enlighten and heat up the human mind, which will become capable of understanding essential truths of faith and burn with love [Fig. 1]. Various details reinforce this spiritual interpretation of a phenomenon which is often described and discussed in scientific treatises and craft handbooks. First of all, Grosseteste specifies that the crystal-like stone must be spherical, without corners where dust might settle. Furthermore, he points out that the fire can be lit only in the point where the physical rays are collected, and, by analogy, only where all believers are one in heart and mind – and here he is quoting a verse from the book of *Acts* (4, 32). With regard to concave mirrors, Grosseteste compares the soul to a mirror where the "ymago Trinitatis" and the "similitudines rerum sensibilium" are reflected. This mirror must be made round, through a correctly directed will,[15] and hollow, since profound humility somehow 'digs' into it. At the centre, we find both God – i.e., a source of light that spreads its rays, enlightens and also shapes the reflecting surface – and the essence of the soul, which lights up and ignites, as the focal point is where parallel incoming rays are refocused.

In other *dicta* we find similar arguments and parallels, albeit with some variations. In *dictum* 55, again devoted to John the Baptist, the author distinguishes between four different types of light ("manifestacio," "manifestans," "manifestata," "cui manifestatur"). The sun, for example, shows itself and its colours to a more powerful light, i.e., sight, but it is not aware of its own nature and of other things. Perfection is achieved in divine light, which manifests every other reality and has knowledge of everything in and by itself. In accordance with this distinction, John, who receives light from God and then illuminates his neighbours, is associated – as in *dictum* 44 – to a "lucerna" and then to a celestial body, since both lamps and "sidera" are not a source of light

[15] See also *dictum* 96. In ms Durham, Cathedral Library, A.III.12 two diagrams summarise and represent the contents of *dictum* 95 and of *dictum* 96. See F. Galli, "Insegnare per figure: le rappresentazioni diagrammatico-simboliche nell'opera di Roberto Grossatesta", in *La scuola di San Vittore e la letteratura medievale*, ed. C. Bologna, C. Zacchetti, Pisa 2022, 229-251.

in themselves. In particular, Elisabeth's son is similar to Lucifer, because he is a "precursor": he precedes the Sun and announces its rising. Grosseteste also adds that Lucifer and Vesper/Hesperus are indeed the same "stella" (i.e., the planet Venus as the morning and evening star), and that – in the same way – John, "non in persona sed in virtute," is the forerunner of Christ as well as of Elias, the prophet whose return heralds the end of the world.[16] Besides, the sun and Lucifer run their course "secundum motum medium et equalem uniformem," in an equal time, and the same is true for the lives of Christ and John, who were roughly contemporaries ("quia non fuit in spaciis vite eorum differencia computabilis").

In *dictum* 60 the analogy between the soul and the mirror returns in a slightly different guise.[17] The soul must work as a flat reflective surface, not a concave one, it should not distort the image of God. To be like that, namely 'righteous,' the human will need to align itself with God's. Moreover, the soul-mirror must be kept clean: for example, tears of penitence can wash away from it the dust of everyday life. Likewise, in *dictum* 72 the parallel between Christ and a crystal-like surface – which we have already found in the first text considered – undergoes another transformation. Human flesh is compared to water, which flows and then vanishes. But, thanks to the coolness of his mother, who conceived him without any lust and passion, Jesus is similar to an ice crystal in his body, and therefore can act like a burning glass and 'ignite' his disciples' hearts – in this regard, Grosseteste inserts a reference to *Mt.*, 24, 32.

Let us try to recap what Grosseteste does in the *Dicta* we have examined. First of all, he takes into account the physical properties of objects and phenomena which are familiar to everybody. Sometimes he also includes brief clarifications about the functioning of such objects (for example, mirrors), although his scientific knowledge of them goes far beyond what he says in this context. The concrete object then

[16] See, for example, *Mt.*, 17, 10-13.

[17] In the same *dictum* Grosseteste also notes that every creature is comparable to a particular kind of mirror, somehow able to reflect the triune God: "quelibet creatura est sic artificialiter compositum, ut de eo resultent unius faciei simulacra plura, utpote omne compositum quasi unam similitudinem trinitatis reddit esse potenciale materie, esse actuale forme, et composicionem forme cum materia."

becomes a symbol,[18] a tool to convey moral or theological teachings in a very clear and effective way. It is noteworthy that the Bible is an integral part of this process. The argument often begins as a comment on a verse or on an image from Scripture, with other biblical passages being evoked in order to enrich and confirm the proposed interpretation. The connections between the observation of the physical world and the contemplation of what lies beyond, between science and theology, between the book of creation and the Bible, are not unidirectional, and the passage from one level to another – surprisingly for us, but not for medieval audience – occurs without interruptions or discrepancies. As already pointed out, the Bishop of Lincoln was unable to create a long-lasting school of thought. However, the extensive use of 'scientific' parallels and similes, not just vague light images, in texts produced by friars who studied in Oxford and Paris in the second half of the 13th century, shows that Grosseteste at least set a pattern for other clergymen and preachers.

Roger Bacon and Peter of Limoges

A great admirer of Grosseteste, Roger Bacon in his *Opus maius* – sent to Pope Clement IV in 1267 – insists on the relevance and usefulness of mathematics, geometry and *perspectiva* "respectu sapientiae divinae" ("with respect to divine wisdom")[19]. On more than one occasion, he maintains that, in addition to their specific uses, these sciences also serve as theological and exegetical tools, as well as sources for captivating and effective metaphors and similes.[20] Furthermore, both in order to elucidate geometrical theories and to visualise biblical objects

[18] On symbolism in Grosseteste's thought, see McEvoy, *The Philosophy of Robert Grosseteste*, 360-368; C. Panti, "Robert Grosseteste's Cosmology of Light and Light-Metaphors: a Symbolic Model of Sacred Space?", in *Bishop Robert Grosseteste and Lincoln Cathedral*, ed. N. Temple, J. S. Hendrix, C. Frost, Burlington 2014, 75. On the notion of "metaphysics of light" and its wide – and sometimes imprecise – uses, see J. McEvoy, "The Metaphysics of Light in the Middle Ages", in *Philosophical Studies* 26 (1978), 126-145; S. A. Gilson, *Medieval Optics and Theories of Light in the Works of Dante*, Lewiston-Queenston-Lampeter 2000, 151-169.

[19] D. C. Lindberg, *Roger Bacon and the Origins of Perspectiva in the Middle Ages. A Critical Edition and English Translation of Bacon's 'Perspectiva' with Introduction and Notes*, Oxford 1996, 320-1 (V.III d.3 ch.1).

[20] See J. M. G. Hackett, "Roger Bacon and the Moralization of Science: From *Perspectiva* through *Scientia Experimentalis* to *Moralis Philosophia*", in *I francescani e le scienze*, Spoleto 2012, 369-392.

and places (e.g., Noah's ark), Bacon attaches great importance to drawings[21] and even suggests creating 3D representations:

> non est possibile ut literalis sensus sciatur, nisi homo ad sensum habeat haec opera depicta, sed magis figurata corporaliter.[22]

As for the parallels between optical and spiritual properties, Bacon actually offers his readers only a few examples. In the last section of his *Perspectiva* (*Pars* III, dist. 3), starting from some biblical passages he briefly considers some features of the pupil and different kinds of vision. When it comes to mirrors, the author focuses on possible military applications – e.g., making things appear larger or creating optical illusions[23] – rather than on moral or theological reinterpretations.

However, another contemporary of Bacon's, Peter of Limoges, in his *De oculo morali* somehow takes up and 'completes' the work begun by the English friar.[24] Peter's treatise was composed in Paris between 1275 and 1289 and soon became very popular as an aid to preachers and, more generally, a manual of moral instruction. The *De oculo* is divided into fifteen chapters and the author proceeds as follows. First of all, in a rather simplistic way, Peter summarises numerous notions and theories, related to visual perception, mainly drawn from Bacon's and Peckham's *Perspectivae*. These observations on the anatomy of the eye, the functioning of sight and the transmission of images serve as the starting point for reflections on man's behaviour and God's way of being and acting. In addition to this, edifying *exempla* and scriptural quotations are employed to enhance the moral teachings and exhortations.

In Peter's search for ideas, Bacon's thorough and clear explanations of phenomena and geometrical principles related to reflection in

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[21] See Lindberg, *Roger Bacon and the Origins*, XLIV. Lindberg points out (XL) that there are far fewer diagrams (or references to them) in Grosseteste's optical works. 'Spiritual' diagrams related to Grosseteste's *Dicta* are examined in Galli, "Insegnare per figure", 229-251.

[22] *The 'Opus Majus' of Roger Bacon*, ed. J.H. Bridges, vol. I, London-Edimburgh-Oxford 1900, 210.

[23] This passage of Bacon's *Perspectiva* is quoted quite faithfully in the *Roman de la Rose*, although the author mentions the work of Alhacen in this regard. See S. Conklin Akbari, *Seeing through the Veil. Optical Theory and Medieval Allegory*, Toronto-Buffalo-London 2004, 88-94.

[24] Peter of Limoges, *The Moral Treatise on the Eye*, ed. R.G. Newhauser, Toronto 2012.

plane, convex and concave mirrors turn out to be a particularly valuable material. This is especially true for chapter six of the *De oculo*, devoted to thirteen optical illusions or misleading perceptions. In the sixth section, Peter reiterates that the vision of an object is weaker if the eye sees it in a mirror.[25] In a previous chapter (III) he had already expounded this concept, which is extremely common, by commenting on Paul's words in the first letter to the Corinthians (I *Cor*, 13:12).[26] Here, nonetheless, the master from Limoges adds a more original remark and specifies that it is for this reason that one often remembers another person's appearance better than one's own, which is known only from reflections. Then Peter compares the eye that sees directly to the person who not only listens to the Word of God but keeps it in his memory and also puts it into practice.

While this first image is rather vague, the parallels in the following paragraphs seem more technical. The author of the *De oculo* clarifies that, if we look at the sun in a mirror placed in water, there will appear to be three suns: the real one, existing in the sky, and two images, on the water and in the mirror. As expected, this example allows him to speak of the mystery of the Trinity: for God can be contemplated by the eye of faith in the water of wisdom and appears as threefold yet singular. Peter – like Bacon before him – also mentions a mistake made by quite a few scientists, who erred by considering one of the reflected images to be that of some star located near the sun. Then, in order to represent divine and human knowledge, Peter illustrates how the images of an object in a concave mirror change, depending on where the object is placed.

> It has been proven in Perspectivist science that if "the eye is in the center of a concave spherical mirror and it looks at the mirror, it sees only itself". [...] This matter is proven as follows: "Since an object located outside the center has rays which fall obliquely onto the surface of the mirror, and since the angles of reflection and incidence must be equal, it follows that the rays are reflected not to the center itself but to the opposite side".[27]

As we can see, Peter once again mentions the science of optics or, more precisely, geometrical optics. With regard to this passage, Newhauser,

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[25] Peter of Limoges, *The Moral Treatise on the Eye*, 29-31.

[26] Peter of Limoges, *The Moral Treatise on the Eye*, 12-13.

[27] Peter of Limoges, *The Moral Treatise on the Eye*, 32-33.

the translator of the *De oculo morali*, refers to Peckham's *Perspectiva communis* (2.41) and to Bacon's *Perspectiva* (3.1.4). Indeed, in this last work we read:

> When the eye is in the centre of a concave spherical mirror, it sees only itself, for nothing is reflected to the centre except what issued from the centre; in fact, only the perpendicular return on itself.[28]

By taking his cue from this optical-geometric demonstration, Peter compares the concave mirror to the heavens and the eye, somehow, to God. In this way he can speak of the divine eye, which "alone understands itself within itself and through itself," and also "knows and understands [...] other objects within himself, insofar as he is an exemplar of all things."[29] In the next section (ch. 6.8), Peter further points out that the image of an object placed at the centre of a concave mirror cannot be perceived by an eye that is not itself at the centre. Likewise, the divine essence cannot be seen by men who, in their earthly existence, are separated from God, located as they are in a different place; conversely, at least something can be grasped by those who are "made one with God" spiritually.

Flat mirrors lie at the core of the tenth section [Fig. 2].[30] On these reflecting surfaces "shapes appear in reverse and in vertical dimensions seem to be upside down," just as many things appear 'reversed' and 'overturned' to "the eye of contemplation" that judges "according to the mirror of holy doctrine." For example, as several biblical passages and episodes show, for Jesus' disciples humility and poverty are valuable and blessed things, while worldly wealth becomes a disadvantage. In addition to these biblical references, the master from Limoges here also recalls an *exemplum* from Valerius Maximus' *Memorable Deeds*, which is explicitly mentioned, and draws his readers' attention to the depictions of the crucifixion to be found in almost every church.[31] He notes that Christ on the cross extends his right hand

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[28] Lindberg, *Roger Bacon and the Origins*, 272-273. In Bacon this assertion is preceded by a complex diagram, which the English friar describes in detail and which Lindberg reconstructed in his edition.

[29] Peter of Limoges, *The Moral Treatise on the Eye*, 33.

[30] Peter of Limoges, *The Moral Treatise on the Eye*, 34-37.

[31] On the close relationship between Peter's treatise and contemporary art, see *Optics, Ethics, and Art in the Thirteenth and Fourteenth Centuries*, ed. H. L. Kessler, R. G. Newhauser, Toronto 2018.

– the 'good' one – towards the north, a direction often associated with hardship, while his left hand is exposed to the 'life-giving' south wind. Also on his mother, placed at the foot of the cross and struck by misfortunes in this life, the wind blows from the north, but this will totally change in the celestial kingdom, where the Virgin will enjoy eternal glory. A concrete image, well-known to the public, thus becomes another means of communicating the same message, of making it immediate and easy to visualise.

As in Grosseteste's *Dicta*, in Peter's treatise the properties of certain objects (such as mirrors), examined according to optical science, constitute a source of inspiration, a basis for 'translating' theological and moral teachings. Whereas the Bishop of Lincoln seems very careful not to make his pastoral writings too technical, the master from Limoges is not afraid to include specific and complex notions in his similes. This perhaps makes his discourse more interesting and innovative for an educated audience, but not entirely clear and accessible to non-specialists. On the other hand, the enormous success of his book demonstrates that Peter's choice did not negatively affect its dissemination and that the task of adapting and possibly simplifying the various ideas could be left to churchmen and preachers. Unlike Bacon, from whose work he often draws scientific contents, Peter does not create or verbally describe diagrams and geometric figures. Nevertheless, he manages to represent spiritual concepts, to make his readers 'see' and memorise them, thanks to incisive descriptions and frequent references to everyday objects and popular images.

Bartolomeo da Bologna and Servasanto da Faenza

Other authors and friars, less renowned than those mentioned so far but educated in the same milieu, employ similar communication strategies, contributing to the Franciscan 'network' that connects Oxford, Paris and, later, also central Italy.[32] Among these, a prominent place belongs to Bartolomeo da Bologna, a Franciscan master who studied and then taught theology in Paris approximately between 1265 and 1275.[33] Bar-

[32] In addition to the studies already mentioned, see D. Raynaud, *L'hypothèse d'Oxford. Essai sur les origines de la perspective*, Paris 1998; Id., *Optics and the Rise of Perspective: a Study in Network Knowledge Diffusion*, Oxford 2014.

[33] On the author and his work, see Galli, *Il 'De luce'*, 3-46.

tolomeo probably met John Peckham in person, and perhaps also Peter of Limoges; moreover, he certainly had access to at least part of Bacon's *Opus maius*. In his Parisian years, he composed his *De luce*, a handbook where preachers could find a lot of information about sensible light, immediately followed by in-depth analyses of the corresponding properties of spiritual illumination.

Talking about the propagation of light (*De luce*, I.3.),[34] Bartolomeo clarifies that *lux* travels spherically, like sound and smell, extending in all directions from a central point, forming a sort of luminous globe. This is seen as corresponding to Christ, who first chose to live in – and bring the Word to – Jerusalem, considered the centre of the world, as also shown in coeval maps ("sicut apparet in mappa mundi"). From Jerusalem, the divine light progressively spread everywhere in space and time (past, present and future), enlightening every creature. In this passage the friar refers to an image (the *mappa mundi*) – one probably familiar to his audience – while in a subsequent section (*De luce*, IV.7.)[35] he explicitly mentions a diagram: "sicut patet in hac figura". Here Bartolomeo begins by saying that if we trace several concentric circles and then draw some lines from the various circumferences to the centre, the smallest and innermost circle is the one crossed by most lines. After briefly recapitulating the Ptolemaic model, the friar remarks that the Earth is at the centre of the universe and that rays – as he has just illustrated – irradiate the central sphere more intensively than any other celestial sphere. As a consequence, the Earth is the most fertile place in the entire universe. In the same vein, but now moving on to spiritual light, humble souls, who never aspire to occupy prominent positions but, on the contrary, are often situated 'at the bottom' of the spiritual universe, receive the most abundant illumination and, thanks to that light, become extremely 'fruitful' and virtuous. Unfortunately, the Florentine manuscript of the *De luce* (ms Firenze, Biblioteca Medicea Laurenziana, Plut.17 sin.8, f. 20r),[36] which is the only witness of this section of the treatise, does not include any diagram. Yet, the space left blank proves that a figure was expected.

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[34] Galli, *Il 'De luce'*, 262-266.

[35] Galli, *Il 'De luce'*, 329-333.

[36] On this manuscript, which includes several optical works, see F. Galli, "The *Perspectiva ad usum praedicatorum* in Late 13th-Century Florence. Some Observations Based on an Examination of Codex Plut. 17 sin. 8 from the Laurentian Library", in *Micrologus* 29 (2021, *Arabic and Latin Theory of Perspective*), 181-202.

Bartolomeo's faith in the power of images and geometrical drawings as a means to convey spiritual truths is even more evident in a disputed question on the Assumption of the Virgin.[37] There the Franciscan wants to explain in detail the disposition of the blessed in the heavenly kingdom and, despite being aware of the infinite possible combinations, he chooses to sketch eighteen different layouts, based on optical and geometrical laws and on the teachings of great *auctoritates* in these fields, such as Alhacen, Euclid, and Theodosius. In his set of representations of the *ecclesia triumphans* the author also includes three-dimensional shapes, for example a truncated cone, a hemisphere, and a triangular pyramid. In Bartolomeo's intentions, his accurate descriptions were to be accompanied by drawings – he often says "sicut hic vides", and sometimes even mentions the points (A, B, C, etc.) to be joined by segments. He takes into account that not everyone would understand the technical contents of his sources (e.g., Euclid's *Elementa*) and repeatedly stresses the usefulness of figures, which can help visualise what the mind cannot grasp. Furthermore, he admits that some three-dimensional shapes are complex and almost impossible to render on a plane surface. As a solution, he likens some dispositions to concrete objects known to everybody, for example a pavilion. Both in the *De luce* and in the *quaestio* the importance that the Bolognese master attaches to scientific knowledge and to the didactic value of figures seems quite remarkable, and in many respects his way of proceeding is analogous to that adopted, on a much larger scale, by Roger Bacon. In the treatise Bartolomeo's references to images – drawn on the parchment or just mentally depicted – should help the reader to comprehend the fundamental concepts, to learn them in the established order, to keep them in mind and, finally, to apply them in everyday life. In the disputed question, geometry takes on a slightly different function. Indeed, it is not used to develop moral parallels or as a tool for exegesis, but is put to the service of theological investigation.

[37] See F. Galli, "No One Will Spend Eternity Behind Christ's Back", in *L'éloquence du visage entre Orient et Occident*, éd. O. Voskoboynikov, Firenze 2022, 155-189; in this contribution references to previous bibliography and a partial edition of the text can be found. The complete edition of Bartolomeo's *quaestio* is currently in preparation.

As far as the "allegorization of matter"[38] is concerned, in his *De luce* (II.1) the Bolognese master compares various ways of believing in God to the effects that light produces on different surfaces (e.g., glass, alabaster, etc.) and outlines a scale of brightness. The four grades identified by Bartolomeo do not correspond to the ones described by Grosseteste in *Dictum* 55, but the way of structuring the reasoning is comparable. Besides, the same paragraphs on the four levels of luminosity are also inserted in a sermon by Bartolomeo.[39] There the friar illustrates three different ways of seeing the light of a candle and, at the same time, divine light. The perception can be direct, without any mediation ("per rectitudinalem inspectionem"), as for the blessed after death. During earthly life God can be seen only *per speculum*, reflected in the mirror of the book of Creation and in Scripture. Christ's contemporaries were particularly lucky, since they had the chance to perceive the light of God through his human body ("per penetrationem") – and here, as in Grosseteste's *Dicta*, the body of Christ is compared to glass, which is transparent. Obviously, some of these similes constitute a well-established *topos* in biblical and exegetical literature. Nevertheless, in the writings by the *perspectivi*, terms like 'direct' or 'reflected' take on a specific meaning and the behaviour of rays falling on surfaces of various kinds is often treated in a rather technical way.

In the *De luce*, as we have seen, the focus is mostly on the theories on light and radiation, whereas sight and the functions of the eye were the central issues for Peter of Limoges. Moreover, in his treatise Bartolomeo gives little space to the properties of mirrors and does not reinterpret them in moral terms.[40] However, the progressive rereading of physical data in a spiritual sense could be carried out by the readers

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[38] See H. L. Kessler, "The Eloquence of Silver: More on the Allegorization of Matter", in *L'allégorie dans l'art du Moyen* Âge*. Formes et fonctions. Héritages, creations, mutuations*, éd. C. Heck, Turhout 2011, 49-65.

[39] See Galli, *Il 'De luce'*, 279-282. Bartolomeo's *sermo in Nativitate Domini* has been published in I. Squadrani, "Tractatus De Luce Fr. Bartholomaei de Bononia", in *Antonianum* 7 (1932), 488-494.

[40] In the preface to his treatise, Bartolomeo remarks that the metaphor of the mirror recurs in the Bible and he also mentions two scientific *auctoritates* on the topic. Nonetheless, he justifies his choice of not dwelling on it by underlining the complexity of the subject: "de speculorum etiam condiccione et diversa representacione, que in *Liber de speculis* traditur et in 5 et 6 et 7 *Scientie perspective* docetur, modicum intelligimus" (Galli, *Il 'De luce'*, 250-251).

of this work, mostly *confrères* and preachers. A marginal note in the aforementioned Florentine manuscript gives evidence of this 'collective commitment' that involves the author as well as his audience. On f. 12r we find a paragraph[41] where Bartolomeo illustrates the functioning of mirrors. He specifies that a mirror – composed of a shining part and an opaque one – does not hold back, but reflects, and therefore makes visible, the image that is continuously generated by a body and 'travels' through the transparent air. In this passage the Bolognese master goes no further, but another hand, presumably coeval with the one that copied the text of the *De luce*, adds something else: "Speculum ex una parte est tersum, ex alia parte clausum; sic anima ex parte Dei aperta debet esse, sed clausa ex parte mundi." The double nature of the mirror thus becomes a model for the soul, which must open itself to God and close itself to the world, and the example is ready to be used in a sermon or for moral exhortation.

Overall, Bartolomeo's treatise seems even closer to speeches actually delivered from the pulpit than the *De oculo morali*. While in his disputed questions the Franciscan displays technical knowledge and cites many scientific *auctoritates*, in the *De luce* he chooses to offer rather simple and straightforward images and similes, which do not require any specific competences to be understood. It is therefore hardly surprising that some paragraphs, including those on the four degrees of luminosity, are copied *verbatim* in the works of another contemporary friar, Servasanto da Faenza,[42] who eagerly devotes himself to preaching and assembling pastoral instruments. Very little is known about the life of this Franciscan, whose vast output includes various treatises (*Liber de exemplis naturalibus*, *Liber de virtutibus et vitiis*, *Summa de poenitentia*, etc.) and a large number of sermons. The manuscript tradition and the references to events, people and places in his writings suggest that his apostolate took place mainly in central Italy, between Emilia Romagna, Tuscany (particularly Florence) and Umbria. We do not know if Servasanto studied in Paris or how well trained he was in the geometric and mathematical sciences. As already noted, he was certainly familiar with Bartolomeo's *De luce*, as he employs it – without

[41] See Galli, *Il 'De luce'*, 269-271 (I.4.b.) and 177; see also *Ibid*., 255-257 (I.2.a.).

[42] On the author, his work and the relevant bibliography, see the recent N. Maldina, "Servasanto da Faenza", in *Dizionario biografico degli italiani*. https://www.treccani.it/enciclopedia/servasanto-da-faenza(Dizionario-Biografico)/ (accessed: 18.11.2021).

mentioning his source, but faithfully reproducing it – in his *summa* on vices and virtues and in some sermons.[43]

A good number of clues suggest that Servasanto was not completely ignorant of optics. In the first four *distinctiones* of his *Liber de virtutibus et vitiis*, he explicitly mentions Alhacen's *De aspectibus* twice. Only in the first case (II.2) does Servasanto repeat what he reads in Bartolomeo, while in the other (IV.6)[44] the quotation from the optical treatise finds no equivalent in the *De luce*. At least in another section (*distinctio* IX), unpublished to date, the Franciscan from Faenza names the "scientia perspectiva." Within a long reasoning on humility, Servasanto points out that:

> Nam probatur in scientia perspectiva quod omne corpus rotundum et spericum ex omni puncto sui sensibili prohicit unam lineam radiosam in centrum. Quare terra eo ipso quo infima est, cum obscura sit per naturam, fit plurimum celesti beneficio luminosa. Sic et super humilem animam, sua reputatione ceteris infimam, descendunt in habundantia divini radii [super eam], illuminantes eam ad omnia que saluti[s] sunt necessaria. Item, quia humilitas facit animam directe sub Deo prostratam esse, et per consequens facit eam radium solis eterni perpendiculariter recipere, ideo multum luminis capere, ita tamen quod quanto humilitas maior, tanto irradiatio super eam potentior. Exemplum de speculo subposito soli nunc orienti, nunc medium celi tenenti, nunc vero occidenti. Et constat quod maius lumen super speculum facit quando est in meridie quam quando est <in> oriente sive in occidente, eo quod in meridie illud respiciat directe, sed in sero vel mane oblique. Anima ergo perfecte humilis, sicut fuit anima sanctissime Dei matris, quare perpendiculariter super se radios divinos excepit, ideo tantam sapientiam a Deo accepit [...].[45]

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[43] On the relationship between Bartolomeo and Servasanto, see Galli, *Il 'De luce'*, 138-148, and F. Galli, "Esempi di 'sconfinamento' fra libri e autori francescani di fine Duecento", in *Oltre le righe. Usi e infrazioni dello spazio testuale*, a cura di V. Allegrini, S. De Simone, A. Forte, D. Panno Pecoraro, Pisa 2020, 67-84.

[44] "quatuor sunt illa que pulcritudinem causant, sicut in 2º *Perspective* probatum est, scilicet lux, separatio, magnitudo et ordo." A critical edition of the first four *distinctiones* of Servasanto's *Liber* can be found in A. Del Castello, *La tradizione del Liber de virtutibus et vitiis di Servasanto da Faenza. Edizione critica delle distinctiones I-IV* – unpublished Ph.D. thesis, Univ. degli Studi di Napoli Federico II, 2013. I wish to thank this scholar for the material he has shared with me and refer to his edition for the passages from the *Liber* mentioned in the present essay.

[45] Ms Firenze, Biblioteca Nazionale Centrale, Conv. Soppr. E VI 1046, f. 78rb. The transcription is mine; integrations are between <...>, expunctions between [...].

Servasanto begins by specifying that, according to the teachings of geometrical optics, every spherical body – and he is thinking of the celestial spheres – emits its rays towards the centre. For this reason, the Earth, which is located at the lowest point, at the centre of a spherical universe, is the planet most exposed to radiation. Then he remarks that the same is true for the humble soul, which receives more enlightenment because it is placed in the deepest part of the spiritual world. Albeit not word by word, this parallel fully corresponds in its contents to that proposed by Bartolomeo in *De luce* IV.7., where the Bolognese master also refers to a figure – to a representation of the Ptolemaic cosmos. Immediately after this comparison, the Franciscan from Faenza inserts a further observation and the example of the mirror, absent in the *De luce*. He states that humility makes the soul bow down directly before God, and, consequently, causes the divine rays to descend on it perpendicularly. The illumination of the humble person, particularly intense, is similar to that of the mirror when it is placed under the midday sun and appears much brighter than in the morning or in the evening.

A quick look at other works by the friar gives further proof of his interest in optics. The first part of the paragraph just commented, including the mention of "scientia perspectiva", also occurs in an almost identical form in a sermon by Servasanto[46] and in his *Summa de poenitentia*.[47] In this latter treatise, many other references to the properties of light, the theories of vision and the behaviour of different kinds of reflecting surfaces are made. For example, the author dwells on the phenomenon of the rainbow, and distinguishes between the doctrines of intramission and extramission.[48] Speaking of the qualities of the res-

[46] See *S.R.E. Cardinalis S. Bonaventurae Opera omnia*, ed. A.C. Peltier, vol. 14, Parisiis 1868, 109b.

[47] Ms Firenze, Biblioteca Nazionale Centrale, Conv. Soppr. G VI 773, f. 19r-v. On Servasanto's treatise, see C. Casagrande, " 'Predicare la penitenza'. La *Summa de poenitentia* di Servasanto da Faenza", in *Dalla penitenza all'ascolto delle confessioni: il ruolo dei frati mendicanti*, Spoleto 1996, 59-101. See also F. Galli, " 'Quanta est via a Bononia usque Florentiam tanta est a Florentia usque Bononiam'. Fatti di cronaca, notizie locali e cenni autobiografici nella *Summa de poenitentia* di Servasanto da Faenza", in *La linea Bologna-Firenze*, ed. J. Bartuschat, S. Ferrilli, Ravenna 2022 (forthcoming).

[48] See ms Firenze, Biblioteca Nazionale Centrale, Conv. Soppr. G VI 773, ff. 107-108. I have transcribed some excerpts in Galli, "Quanta est via" (forthcoming).

urrected body, the Franciscan discusses at length the features of light rays, on how they pass through diaphanous surfaces and instead 'break' when they encounter a concave mirror ("circa speculum concavum, sicut patet ad sensum, fit confractio radiorum").[49] And in a sermon on *Mt*, 11:29, while focusing on the virtue of humility, the preacher repeats more or less the same contents [Fig. 3]:

> Nam etiam videmus ad sensum, quod solares radii dum ad speculum concavum veniunt, se multiplicando et coarctando, tantum splendorem et calorem ibi efficiunt, quod illi oppositam stupam incendunt. Sic et divinae gratiae et scientiae, dum ad humile cor perveniunt, totum igneum et splendidum reddunt. E contra corpus solidum et opacum, radio solari non pervium, dum opponitur advenienti, resistit, ipsum in suo profundo non recipit, sed in sola ejus superficie radius se diffundit. Sic lumen scientiae si oblatum arrogantibus et superbis non penetrat ad intima cordis [...].[50]

The more specific and technical aspects are not investigated, and Servasanto has neither the competences nor the intention to devote himself to strictly scientific problems. Nevertheless, the presence of optics in his writings, including both moral treatises and actual sermons, is certainly significant. Once again, it proves that at the time, at least in a certain milieu, basic notions of *perspectiva* were part of the cultural background of theologians, philosophers, preachers, and even secular scholars and poets. The reason for the popularity of this discipline is quite evident: optics made it possible to understand how many things in the visible world work, but also to find suitable images and examples to transmit knowledge in a simpler way and to represent what cannot be seen.

Conclusions

The research path presented here could and should be extended in several directions. For example, much remains to be explored concerning the uses of the 'spiritual' *perspectiva* – and therefore of optics and geometry applied outside their specific field – in Peckham's writings. Moreover, other thinkers and works – close to the milieu of the Franciscan *perspectivi* and circulating within the England-Paris-Central Italy

[49] Ms Firenze, Biblioteca Nazionale Centrale, Conv. Soppr. G VI 773, f. 108va. The transcription is mine.

[50] *S.R.E. Cardinalis S. Bonaventurae Opera omnia*, vol. 14, 86b.

'triangle' – deserve to be taken into consideration. Particularly noteworthy are the English friars Thomas Docking[51] and Walter of Wimborne,[52] the French Eustache d'Arras[53] and Peter John Olivi,[54] and the Italians Matteo d'Acquasparta[55] and Marco da Orvieto (or Marcus ab Urbe Veteri). The last of these is the author of the *Liber de moralitatibus*, "a 'moralization' of Bartholomew of England's *De proprietatibus rerum*"[56] composed between 1281 and 1291. In turn, the paragraph devoted to light and vision (and also shadows, colours, etc.) in Bartholomew's encyclopedia, including its marginal notes, must be thoroughly analysed, given its vast circulation and its close link to coeval optical treatises.[57]

All in all, in the writings examined, our learned medieval preachers and scholars – also engaged in pastoral tasks – have no intention of discussing and coming up with new scientific theories. Conversely, they use their strong or limited competence in mathematical and natural sciences for other purposes. Their knowledge of the properties of light, mirrors, etc. becomes a source of visual 'aids,' an adaptable tool which allows them to explain, represent, and communicate several ideas and

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[51] See C. Panti, "The Theological Use of Science at the Oxford Franciscan School: Thomas Docking, Roger Bacon, and Robert Grosseteste's Works", in *The Franciscan Order in the Medieval English Province and Beyond*, ed. M. Robson, P. N. R. Zutshi, Amsterdam 2018, 181-210.

[52] See at least D. R. Townsend, "Robert Grosseteste and Walter of Wimborne", in *Medium Aevum* 55 (1986), 113-117.

[53] S. Delmas, *Un franciscain à Paris au milieu du XIII^e^ siècle. Le maître en théologie Eustache d'Arras*, Paris 2010, (esp. 332-333, 366-367).

[54] See at least D. Demange, "Olivi et les *Perspectivi*", in *Oliviana*, 2016. http://journals.openedition.org/oliviana/850 (accessed: 13.10.2021); Id., "Bacon/Olivi. Un état des lieux", in *The Philosophy and Science of Roger Bacon. Studies in Honour of Jeremiah Hackett*, ed. N. Polloni, Y. Kedar, London 2021, 187-202; Jacquart, "*Perspectiva* et exégèse".

[55] On the relationship between Matteo d'Acquasparta and Bartolomeo da Bologna, see Galli, *Il 'De luce'*, 137.

[56] *Marci de Urbe Veteri Liber de moralitatibus*, ed. G. J. Etzkorn, vol. I, St. Bonaventure N. Y. 2005, II.

[57] See at least *The Dimensions of Colour. Robert Grosseteste's De colore*, ed. G. Dinkova-Bruun *et al.*, Toronto 2013, 70-84. See also the recent S. Delmas, "Bartholomew the Englishman, 'Master of the Properties of Things': Between Exegesis and Preaching", in *Early Thirteenth-Century English Franciscan Thought*, ed. L. Schumacher, Berlin-Boston 2021, 243-260.

concepts, and especially spiritual truths, in a clear, effective and sometimes even captivating way. Nonetheless, by making technical and specialist disciplines part of their theological and moral discourse, they still contribute to justifying the cultural usefulness of such branches of learning for churchmen – but also laymen.

The 'power' assigned to figures and diagrams, as well as to the process of creating them, either in one's mind or on parchment, is another fundamental *trait d'union* between medieval science and coeval pastoral care. Geometry, astronomy and optics inherently deal with lines, shapes and angles of incidence; many relevant notions and demonstrations in these fields need to be illustrated, also through actual representations, in order to be understood – and this remains true even today. Teachers and students who approached these disciplines in medieval schools could turn to manuscripts containing verbal descriptions (e.g., "join points a and b") and diagrams, and were used to thinking in images.[58] At the same time, we cannot forget the increasingly significant role that tables, textual layouts, and figures began to play in the new didactic and exegetical methods established, for example, by Hugh of Saint Victor.[59] The drawings made in classrooms, the figures in books, the similes and mental images depicted in sermons – and even the 'real' objects and paintings to be found in the spaces used by speakers and their audiences – made both educated and illiterate people able to fix concepts in their mind, to visualise and memorise them in an orderly manner,[60] and to rely on sensory experience as well as on intellectual comprehension.[61] The aforementioned authors, both as teachers and as preachers, were well aware of all this and, more or less actively and

[58] The bibliography on the topic is vast: see at least the recent J. C. Schmitt, *Penser par figures. Du compas divin aux diagrammes magiques*, Paris 2019. See also F. Ohly, *Geometria e memoria* [1982], a cura di L. Ritter Santini, Bologna 1984, 189-247; B. S. Eastwood, *Astronomy and Optics from Pliny to Descartes: Texts, Diagrams, and Conceptual Structures*, London 1989.

[59] See at least P. Sicard, *Diagrammes médiévaux et exégèse visuelle. Le* Libellus de formatione arche *de Hugues de Saint-Victor*, Paris-Turnhout 1993.

[60] On this specific aspect, see also the collective volume *Ordinare il mondo. Diagrammi e simboli nelle pergamene di Vercelli*, a cura di T. Leonardi, M. Rainini, Milano 2018.

[61] See at least M. Carruthers, *The Book of Memory*, Cambridge 1990 (esp. ch. 3); Ead., *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400-1200*, Cambridge 1998.

consciously, contributed to the development of a new form of 'mass communication' extensively employed by the mendicant orders.[62] And within this process, optics and *perspectiva* would appear to have played a notable part.

Università della Svizzera italiana
Universität Zürich
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[62] See at least L. Bolzoni, *La rete delle immagini*, Torino 2002.

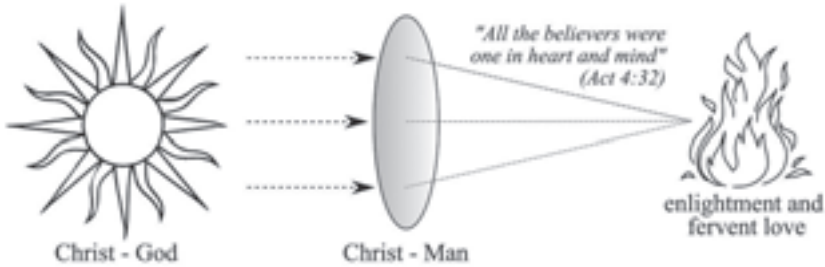

Fig. 1. Robert Grosseteste, *Dictum* 44

Fig. 2. Peter of Limoges, *De oculo morali*, 6.10

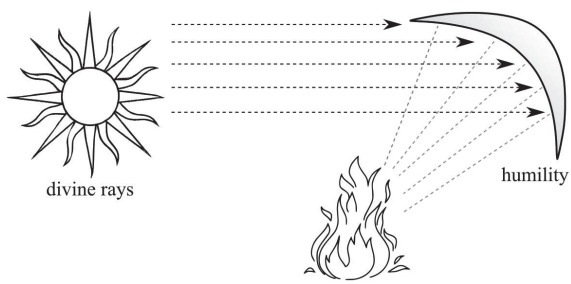

Fig. 3. Servasanto da Faenza, sermo on *Mt.,* 11, 29

The Visualization of Motion
Averroes and Albertus Magnus

José Higuera

Annelise Maier, in her classic essay *Forma fluens oder fluxus formae?*,[1] launched the foundational study about the medieval reception of the discussion, extracted from Latin-Arabic sources, around the motion boundary-points – beginning/end – and its logical categorization. Furthermore, the issue involves questions about the relation between those boundary-points as contraries or opposites, and how those relations modify the process flow's conception of the intermediate course of motion.[2] Those physical questions focus on resolving the

[1] A. Maier, "Forma Fluens oder Fluxus Formae", in *Zwischen Philosophie und Mechanik*, Rome 1958, 61-75; "The Latin translation of Avicenna's Physics, the *Sufficientia*, does, in fact, contain a passage that conveys the sense of the distinction without, however, introducing the two concepts in question", A. Maier, "The Nature of Motion", in *On the Threshold of Exact Science: Selected Writings of Anneliese Maier* , ed. S. Sargent, Philadelphia 1982, 24.

[2] A. Hasnawi, "La definition du mouvement dans la Physique du *Šifā*' d'Avicenne", *Arabic Sciences and Philosophy*, vol. 11 (2001) 219-255: "Le mouvement, qu'Avicenne décrit comme la 'réalité continue pensée' qui, pour ainsi dire, s'étend entre le terme premier et le terme dernier de ce mouvement, ne se réalise pas dans le mobile lorsque celui-ci est dans cette situation intermédiaire"; J. McGinnis, "A medieval Arabic analysis of motion at an instant: the Avicennian sources to the *forma fluens*/*fluxus formae* debate", in *The British Journal for the History of Science* 39/2 (2006), 2-5; Aristoteles, *Physica*, l. 8, c. 7; l. 4., c. 11, ed. F. Bossier, J. Brams, A. Mansion (Aristoteles latinus 7), Leiden 1990, 261b1, 317; 220b25, 180: "[…] alterationi autem contrarie passiones, augmento autem et detrimento aut magnitudo aut parvitas aut perfectio magnitudinis aut inperfectio; contrarii autem sunt qui sunt in contraria. Quod autem non semper movetur secundum hunc motum quo prius, est necesse primum quiescere. Manifestum autem est quod quiescet in contrario mutans"; and about the multiple magnitudes and measures: including time: "Propter quidem enim quod est magnitudinem esse huiusmodi motus hec sustinet. propter autem motum tempus. Et mensuramus et magnitudinem motu et motum magnitudine: multam enim dicimus esse viam si processus multus", On the first reception on motion's definition and its Arabic echo: J. Puig, "Zur Bewegungsdefinition im VIII. Buch der *Physik*", in *Averroes*

Per cognitionem visualem. The Visualization of Cognitive and Natural Processes in the Middle Ages
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predication of categorical variables: quality, quantity, place, and other categories, which are manifested in natural transformations. Latin-Arabic sources suggest to Maier a metaphysical solution focuses on potency called *forma fluens* and its physical perceptible realization *fluxus formae*, which explains the "path" (*via*)[3] of natural motion and its unlimited cases of actualization. However, this is a contentious view if, for instance, we think about house building, getting healthy, teaching science, or human aging.[4]

The potentiality of "form's path" and the actualization of "path's form" accomplish a metaphysical conceptualization about how every natural motion inherits its own pathway according to Aristotelian metaphysical notions: final realization (*entelekheia-perfectio*), efficient production (*kinesis-agens*), realization process (*energeia-actus*)

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and the Aristotelian Tradition: Sources, Constitution and Reception of the Philosophy of Ibn Rushd (1126–1198), ed. G. Endress and J. A. Aertsen (Islamic Philosophy, Theology and Science. Texts and Studies 31), Leiden 1999, 145-150.

[3] Averroes, *Commentarium magnum in Aristotelis De physico auditu libri octo*, in *Aristotelis Omnia quae extant Opera...Averrois Cordubensis in ea Omnes...Commentarii* v. 4, l. 5, c. 3, Venetiis 1552 (repr. Frankfurt 1962) 214K: "Et videtur quod si potentia ad unumquodque praedicamentum est in illo genere praedicamenti quod est in actu, et similiter via de potentia ad actum, scilicet si potentia ad substantiam est quoq modo in praedicamento substantiae, et similiter via ad generationem substantiae et similiter potentia ad quantum et ad alia praedicamenta"; Averroes, *Epitome in Physicorum libros*, (Corpus Commentariorum Averrois in Aristotelem 20), l. 6 c. 7, ed. J. Puig, Madrid 1983, 206-208; Averroes, *Commentum magnum super libro De celo et mundo Aristotelis*, l. 2, c. 9; l. 4, c. 3, v. 2, ed. F. J. Carmody and R. Arnzen, Leuven 2003, 380; 704.

[4] Aristoteles, *Physica*, l. 3 c. 1, 201a 16 - 201a 2, ed. Bossier, Brams et Mansion, 99: "Quod autem hoc sit motus, ab hinc manifestum est. Cum enim edificabile, in quantum huiusmodi ipsum dicimus esse, actu sit, edificatur et hoc est edificatio; similiter autem et doctrinatio et medicatio et volutio et saltatio et adolescentia et senectus"; Averroes gives other examples: "[...] uisum est quod illud esse quod est inter potentiam et actum in illo genere sit sub illo genere, quoniam esse medium inter potentiam et actum quae sunt in illo genere necessario est de genere actus qui est complementum, sed differunt secundum magis et minus. Ire enim ad calorem est calor quoquo modo, et similiter ire ad frigus. Et secundum hunc modum est verum dicere quod motus est in genere in quo est illud ad quod est motus, scilicet secundum suam materiam", Averroes, *Commentarium magnum*, l. 5, c. 3 f. 215A. See also: C. Trifogli, "The Reception of Averroes' View on Motion in the Latin West: The Case of Walter Burley." In *Averroes' Natural Philosophy and Its Reception in the Latin West* (Ancient and Medieval Philosophy 1), ed. P. Bakker, Leuven 2015, 130, n. 7.

and motion potentiality (*dunamis-potentia*).[5] This debate is a return to Avicenna and Averroes over Aristotelian commentaries on *Physics* by Alexander, Themistius, and Simplicius (among others). Maier put forward the reception of this metaphysical conceptualization during the 14th century in Burley, Oresme, Buridanus, or Blasius de Parma. Still, Ruth Glasner states about Averroes' account of *forma fluens* that it was one of his "greatest achievements."[6]

Nonetheless, there is another aspect to this question, perhaps slightly dismissed. Maier introduced it through a quotation from Avicenna's *Sufficientia*:

> Maneries vero quae continentur sub nomine motus sunt species aut maneries praedicamentorum: quia de ubi quaddam est quietum, et quoddam est pertrasiens qui est motus in loco. Et de quali quoddam est quietum et quoddam est pertrasiens et hic est motus alterationis. Et quanto quoddam est defluens, et hoc est motus in quanto qui est augmentatio et diminutio […] Et dixerunt quod haec quantitas defluens una est ex speciebus quanti continui […] et dixerunt quod nigrescere et nigredo unum genus sunt, sed nigredo est quieta, nigrescere vero non est quietum.[7]

It's remarkable that, among the three different motion categorizations, only quantity can "flow" (*defluere*) along the motion path. On the oth-

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[5] Aristoteles, *Physica*, l. 3, c. 1, 200b 27 - 200b 32: ed. Bossier, Brams et Mansion, 97: "Est igitur aliquid quod quidem ἐντελέχεια, id est actu, tantum est, aliud autem potentia et ἐντελέχεια, hoc quidem hoc aliquid, aliud vero quantum, aliud vero quale, et aliorum entis est predicamentorum similiter. Sed ad aliquid aliud quidem secundum habundantiam et defectum dicitur, aliud autem secundum activum et passivum, et omnino motivum et mobile, motivum enim motivum mobilis est et mobile mobile a motivo est". Puig, "Zur Bewegungsdefinition", 155-156.

[6] Maier, "The Nature of Motion", 25; Maier, "Forma Fluens oder Fluxus Formae?", 65-67: "Averroes himself formulates the problem as follows. On the one hand, motion differs from the 'perfection' attained as a result of the motion only in degree, not in essence […] on the other hand, one considers motion to be the process by which the 'perfection' is attained, then it is a genus unto itself, since the 'way to the thing' (via ad rem) is different from the 'thing' itself"; R. Glasner, *Averroes' Physics: A Turning Point in Medieval Natural Philosophy*, Oxford 2009, 109; 112-114: "I shall argue that his new concept of motion [as continuous entity], later termed *forma fluens*, was one of Averroes' greatest achievements".

[7] Maier quotes from Urb. Lat. 186 31r-32v, Maier, "Forma Fluens oder Fluxus Formae?", 69; Avicenna, "Sufficientia", in *Auice[n]ne Perhypatetici Philosophi… Logyca. Sufficientia. De Celo & Mundo. De Anima. De Animalibus. De Intelligentiis. Alpharabius De Intelligentiis. Philosophia Prima*, Venetiss 1508, f 24v-25r;

er hand, quality and the local motion "traverse" it (*pertrahere-pertrasiere*). Following Maier's long Avicenna's quotation, we can read:

> Et dixerunt quod hac *quantitas defluens* una est ex speciebus quanti continui […] Et discordaverunt auctores in hoc nomine *pertruasienti*, quia quidam ex eis diversicaverunt inter nigredinem et nigrescere diversitate differentiae specificae. Quidam autem ex eis diversificaverunt non diversitate differentiae specificae, *sed quia est sicut additio, quae additur lineae quae sit maior, et tamen propter hoc non exit a sua specie.*[8]

Avicenna points out quantitative motion as increasing and diminishing, like one continuous *speciebus*. This notion could resolve the disagreement about the difference between *nigredinem* (blackness) and *nigrescere* (becoming black)[9] because they are like geometrical lines in which adding a line to another does not affect its continuity. He then concludes:

> Et omnino si fuerit id de quo est et ad quod est qualitas [the same as the example of lines, motus est in qualitate. Si vero fuerit quantitas, motus est in quantitate. *Et de omnibus istis motibus praedicatur motus univoce.*[10]

Is this 'continuity species' the principle of motion unity and its predication univocity? It is so difficult to reach it and would undoubtedly be a subject of a different study. However, to carefully handle this notion, please appreciate what Maier said about *quantitas defluens*: It is *eine Spezies der kontinuerlichen* likely *nigredinem-nigrescere.*[11] However, Maier, and some scholars afterwards, highlighted *forma fluen*s as a key-concept of medieval interpretation of physical motion putting aside the continuity issue. Indeed, they developed meaningful research about quantification of theological notions but not exactly on *quantitas defluens* as *species quantitas continuum* like the Cordoba's master, Averroes, actually does in his works, in line with Aristotle.[12]

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[8] Maier, "Forma Fluens oder Fluxus Formae?", 69; Avicenna, "Sufficientia", f. 24v-25r.

[9] McGinnis, "A medieval Arabic analysis of motion", 6; Trifogli, "The Reception of Averroes' View on Motion", 134.

[10] Avicenna, "Sufficientia", f. 24v-25r.

[11] Maier, "Forma Fluens oder Fluxus Formae?", 69-70.

[12] Averroes, *Commentarium magnum*, l. 3 c. 2, 87D: "Secundum autem quod est via ad perfectionem quae est alia ab ipsa perfectione necesse est ut sit genus per se. Via enim ad rem est aliud ab ipsa re. Et secundum hoc fuit positum praedicamentum per se.

«Amphibolous» lines and Induction

In the *Commentum Magnum super Liber de Celo*, Averroes underlines the motion's subjects of natural knowledge, leading us to *maxima cognitio*.[13] These subjects are *corpus et magnitudo* that accomplish the role of natural causes of *scientia demonstrativa*. He understands those subjects according to its parts. On the one hand, according to Aristotle, *corpus* allocates three dimensions –longitude, latitude, and deepness – and, on the other hand, *magnitudo* splits in line, surface, and body. *Magnitudo*, abstractly studied by mathematicians, depends on the nature of matter and its variable bodily manifestations. Natural knowledge is, thus, the research about the magnitude of bodies' accidental dimensions which are susceptible to divisions and its continuous species.

Quoting Themistius, Averroes states that motion gathers local displacement (in which substances do not change in themselves) and every transformation of its sensible qualities.[14] Thus, motion's accidental examples acquire specific denominations in relation with its sensible occurrence. To complete this task, natural science considers the embodied magnitudes *in materia* as its *subiectum universale* whose definition departs from the conception of continuum which is *illud quod dividitur in res divisibiles semper et nunquam terminabitur divisio sicut declaratum est in sexto de Auditu Naturali*.[15] Continuous is the genus

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Et iste modus est famosior, ille autem est verior, et ideo Aristoteles induxit illum modum famosum in Praedicamentis et istum modum verum in hoc libro". Trifogli endorses that: "[…] To use Albert's example, taken from Averroes [!], the process of blackening and blackness are essentially identical: *nigrescere est nigredo*", C. Trifogli, *Oxford physics in the thirteenth century (ca. 1250-1270): motion, infinity, place, and time* (Studien und Texte zur Geistesgeschichte des Mittelalters 72), Leiden-Boston 2000, 49.

[13] Averroes, *Commentum magnum super libro De celo*, v. 1, l. 1, c. 1, ed. Carmody et Arnzen, 2.13-19.

[14] Averroes, *Commentarium magnum,* Proemium Averrois, 4B: "Proportio [*relation/Harvey*] autem istius libri ad scientiam naturalem est sicut proportio elementorum rei ad rem [*elements of a thing to thing/Harvey*], quia iste liber comprehendit res, quae sunt sicut principia et radices universales illorum, in quibus vult alloqui naturalis"; S. Harvey, "The Hebrew Translation of Averroes' *Prooemium* to His *Long Commentary on Aristotle's Physics*", in *Proceedings of the American Academy for Jewish Research* 52 (1985), 55-84; Averroes, *Epitome*, l. 6, c. 6, ed. Puig, 206.29-34.

[15] Averroes, *Commentarium magnum*, Proemium Averrois, f. 2; Averroes, *Epitome*, l. 6, c. 3, ed. Puig, 196.4; Averroes, *Super libro De celo et mundo*, l. 1 c. 1, ed. Carmody et Arnzen, 515-524.

of embodied magnitudes and the measures of *locum, tempus, superficiem, lineam et motum*.

The intensity of Averroes' claims about "continuous" is deeply studied in his commentaries – *Magnum* and the *Epitome*[16] – on Aristotelian Physics. In this section and throughout this paper, I am especially interested in the *Commentarium magnum*'s preface, and the *Epitome´*s paraphrases. In those texts, Averroes' interpretation goes around two main topics: the demonstrative method of *scientia naturalis* and the linguistic connotations of the Aristotelian categorical denominations of motion accidents in natural perceptible things. This last point is the root of the *physical akroasis – physicum auditum* –which is the activity of "hearing" nature's discourse. In both, *Commentarium magnum* preface and *Epitome* demonstrations are introduced *a priori*, by principles and definitions, and *a posteriori*, by induction.[17] In Iacobus Mantinus' preface translation from Hebrew (he was a well-known *condotieri*'s physician with Sephardic roots, educated in Padova and established in Venice in the first half of 16th century),[18] there are two further ways of demonstration: by division and by example, like in rhetoric and poetics.[19] Harvey quotes these ways in his English edition of the preface, the same as in *Epitome*. Those types of demonstrations – or "instruction" according to Harvey's translation – in Arabic version are "comment" (*sahr-aššara*) or "meanings explanation" and "illustrative" (*Irshad-to instruct/to show a path*). Josep Puig – *Epitome*'s editor – links *irshad* (*guidance*) with the sacred interpretation of Coranic's examples and stories.[20] The division of sciences, and its hierarchy, depends on the use of demonstrative methods such as mathematics and its aprioristic proofs (*simpliciter* or "absolute"), while physics should seek

[16] Averroes, *Epitome*, l. 7, c. 1, ed. Puig, 217-218.11-22..

[17] Averroes, *Commentarium magnum,* Proemium Averrois, 4F"[…] tres modi demonstrationum scilicet signi et demonstratio causae et demonstratio simpliciter, quamvis signum et causa sit plus usitata in hac scientia, et aliquando est usitata demonstratio simpliciter et maneries disciplinae divisionis et diffinitionis et enthymematis et inductionis [*Harvey: and by example / Mantinus: et eodem quod per exemplum*], quia unus istorum quinque utitur arte demonstrativa secundum modum datum in *Posterioribus*"; Harvey, "The Hebrew Translation of Averroes' *Prooemium*", 82.

[18] D. Kaufman, "Jacob Mantino: une page de l'histoire de la Renaissance", in *Revue des études juives* 27 (1893), 14.

[19] Averroes, *Epitome*, l. 5, ed. Puig, 169.7-14.

[20] *Ibid.*

the coincidence between natural and perceptible examples to illustrate the proportional application of principles – *per se notae* – which are asserted inductively. In *Commentum Magnum super Liber de Celo* this demonstrative method is assumed by Averroes, who said that all those demonstrative types are not *sinonima*. Therefore, *scientia naturalis* is inductive and illustrative, and tries to reach a certainty about the roots – or first elements – of sensible knowledge.

Thus, the focus on "illustrative" linguistic and logical implications on inductive method appears in other passages from *Preface* and *Epitome*. The equivocal predication of the name "human being" (*hominis*) could be attributed to a living singular, a dead human, or a rational human being, and also, to *hominis* […] *lapideo* which Mantinus translated as "*picto in lapide*" and Harvey as "[being] carved from stone."[21] This ambiguous predication reminds us of the famous passage of Aristotle's *Categories*[22] where the example of *similitudo*, the homonymous attribution of the term "Homo" – in the Latin version – takes place in relation to a singular human being and some "homo pictus."[23] These sort of logical difficulties produced by ambiguity, or not assumed homonymies, are the argument of Averroes' claim about the "substitution" that Themistius does between "motion" and geometrical "lines."[24]

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[21] Averroes, *Commentarium magnum,* Proemium Averrois, 4K: "Est aequivoca praedicatio [*Harvey's note: "amphibolous terms"*], sicut nomen hominis praedicatur de homine vivo et homine mortuo sive praedicatio hominis de rationale et lapideo [Mantino: *et picto in lapide* / Harvey: and of the (being) carved from stone]"; Harvey, "The Hebrew Translation of Averroes' *Prooemium*", 74.

[22] Aristoteles, *Categoriae vel praedicamenta*, c. 1 1a1-1a3, ed. L. Minio-Paluello (Aristoteles Latinus 1), Bruges 1961, 55: "Aequivoca dicuntur quorum nomen solum commune est, secundum nomen vero substantiae ratio diversa, ut animal homo et quod pingitur"; "Aequivoca dicuntur quorum nomen solum commune est, secundum nomen vero substantiae ratio diversa, ut animal homo et quod pingitur". Cassiodorus, *Institutions of Divine and Secular Learning and On the Soul*, ed. J. Halporn, Liverpool 2004, 192.

[23] It could be a mistranslation of original Greek *zoôn* which means both "animal" or "image". This was spotted by Irene Rosier, in I. Rosier, *L'Ambiguïté: cinq études historiques*, Lille, 1988, 62-66. It seems that Arab and Hebrew sources hit the same stone.

[24] Themistius, *On Aristotle Physics* 5-8, ed. R. Todd, London 2008, (228a 24-b11 - 229a1) 35-36: "But since all change is continuous, if indeed all of it is divisible, then [change] that is one must be without qualification continuous, and continuous [change must be] one; for it could not become continuous with every [change], as neither could

In the *Epitome*, Averroes argues against Theophratus, Themistius, and their followers, who endorse the homonymous substitution between the line as geometrical representation of motion, and the natural motion perceptible in nature. He states that it is not acceptable that the line's properties could be attributed to physical motion and change itself. The substitution of properties representation in the research of accidental phenomena is completely opposed to the inductive demonstration of physical motion.[25] Puig adds a footnote about this claim. He adds that the meaning of "substitution" in this passage is an inappropriate application of metaphorical *traslatio* from representation to natural phenomena. And Harvey's translation supports the perspective of ambiguous predication and the conception of "amphibolous"[26] terms in Hebraic tradition in which a "substitution" of terms' meanings and references occurs, for instance, "human being" regarding "[being] carved from stone."[27]

The "substitution" between lines, as representation of motion, and their perceptible natural properties – which was Averroes' strong claim – was a common assumption in 13th century, owing to the translation – by Robertus Grosseteste – of the pseudo-Aristotelian work *De lineis*

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one random thing with another (e.g. a line with a sound), but [only] with those things whose extremities can succeed in becoming one. Certainly the extremity of a line and a walk are homonymously related to one another as an extremity, which is why something that is one and continuous does not come into being from them either. Non-uniformity comes about [either] when [a change] is contra-natural across [the magnitude] it covers, as, for example, with a deflected line (for a uniform change cannot have come into being unless across a uniform magnitude, and a uniform magnitude is one of which any random part fits directly on to any other); or when, contrary to the manner [of the change], it is faster at one time, slower at another".

[25] Averroes, *Epitome*, l. 6, c. 5, ed. J. Puig, 205.1-6.: "El lugar común en el que se equivocaron Teofrasto, Temistio y los comentadores que les siguieron pertenece a uno de los tópicos de la sustitución, en el que se toma en vez de la cosa, su representación imaginativa o figurativa, de modo que se toman las propiedades correspondientes a la representación de la cosa como propiedades de la cosa",.

[26] "A further extension of the use of 'ambiguous' terms is to be found in Averroes' *Epitome* of Porphyry's *Isagoge*. Defining an 'ambiguous' term as that which is applied to different things which are related to one source, as, e.g., one agent, or to one end or to one subject H. Wolfson, "The Amphibolous Terms in Aristotle, Arabic Philosophy and Maimonides", in *Harvard Theological Review* 31 (1938) 160.

[27] Harvey, "The Hebrew Translation of Averroes' *Prooemium*, 82-83.

insecabilibus/ or *De indivisibilibus*.[28] The "amphibolic" comprehension is clearly represented in the capital[29] letter in which a medieval master points a line as if he factually sees how it *flows* between heaven and earth. For Averroes, probably, this is an audacious example of "metaphorical" substitution – *transumptio* – in which geometrical representations frame *scientia naturale*'s demonstrations, by perceptible examples.[30] Nonetheless, Albertus Magnus prosecuted the followers of this metaphorical license as Platonists who thought that geometrical abstractions compound material substances. But he accepts *De indivisibilibus* as an Aristotelian work, he even includes a paraphrase about it at the end of his commentary on *Physics'* Book 6.[31] Moeberke's new translation drove Aquinas' declaration about the author of this treatise: Theophrastus. This is the same "character" indicated by Averroes as the author, and his followers, who endorses the substitution of the properties of geometrical representation of motion by the natural motion itself.

Luckily, the "amphibolous" reception of the geometric properties of motion – as a line – was just an equivocal and illustrative use in order to launch the relevance of the discussion about the ultimate elements of substantial and accidents composition. This was, according to Averroes, an "illustrative" source to approach the questions of motions and accidental divisions introduced by Aristotle in the *Physics*, Book 6, together with Zeno's paradoxes. Undoubtedly, the emergence of those aporetic arguments, in the intellectual environment of the 13th century, highlights the weight of ancient tradition. The unlimited division of a line, representing the impossible race between two different speeds and the infinite vertigo, generated by the iterative pass over each point of the line, it is a challenging subject of medieval motion visualisations.

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[28] In the mss. Vat. Lat. 2084, f. 121r, appears the attribution to Pseudo-Aristotle of *De lineis indivisibilibus liber*, *in Latinum sermonem translatus a Roberto Grosseteste*; S. Harrison, *The Writings of Robert Grosseteste*, *Bishop of Lincoln 1235-1253*, Cambridge 1940, 67-68; "Though the treatise is published amongst the works of Aristotle, there are grounds for ascribing it to Theophrastus […] Strato, or possibly by someone otherwise Unknown", Pseudo-Aristoteles, *De lineis insecabilibus*, ed. H. Joachim, Oxford 1908.

[29] Pseudo-Aristoteles, *De lineis indivisibilibus liber, in Latinum sermonem translatus a <Roberto Grosseteste>*, Vat. Lat. 2084, f. 121r.

[30] Averroes, *Epitome*, l. 6, c. 5, ed. Puig, 205.

[31] Albertus Magnus, *Physica,* Lib. 6, cap. 7, ed. P. Hossfeld (Opera Omnia 4), Münster1987-1993,, 498-515; S. Snyder, "Albert's Physics", in *A Companion to Albert the Great*, ed. I. Resnick, Leiden 2013, 201-204.

Lines and the geometrical relation of its parts acknowledged as species of *continuous quantity* – according to Avicenna – open the reentrance of physical mathematics in medieval philosophy,[32] exemplified by Albertus Magnus' definition of the line: *lineam constitui ex fluxu puncti et non ex compositione ex punctis*.[33]

Movement visualizations (*Physica* VI)

Avicenna's argument about univocity of motion by the addition of continuous lines is in fact an Aristotelian assumption: two motions are continuous when their limits are touching, so by continuity they "become the same." But if there are more than two limits, they are two different examples of motion, two different magnitudes, two independent accidental denominations. The complex question about how to add contiguous lines over a continuous motion without falling in unlimited additions has a plain answer: every motion has limits from point A to B that constrains it to path C. This geometrical line, or line-segment, is the Aristotelian "favorite model of the continuum".[34] Thus, an exposition about *Physics* 6th book usually starts with this sentence: "to grasp Aristotle's continuous motion theory envisions a line-cut" – and indeed, medieval masters did the same. The line representation hides a stimulating assumption: the object (X>a train) that moves from A to B has to pass along every point of the line. This means that X passes along Cn points, that represent magnitude and motion's time lapse.[35] As usual, Aristotle does not say if, we

[32] McGinnis, 16: "For Avicenna, mathematical analysis and the objects of mathematics involve mental constructs abstracted from concrete physical objects, where the physical objects themselves set the constraints on the constructions that the mathematician can make. In one very important respect, then, the science of mathematics is subordinate to the science of physics"; A. Lo Bello, "Albert Great and Mathematics", in *A Companion to Albert the Great*, ed. I. Resnick, Leiden 2013, 391: "A medieval Arabic analysis of motion", "[…] he [Albert] understood that physics could not be done without mathematics".

[33] Albertus Magnus, *Physica*, "De lineis", c.1, ed. Hossfeld, 498.

[34] D. Bostock, *Space, time, matter and form: essays on Aristotle's physics*, Oxford 2006, 158: "Aristotle's favourite model of the continuum is the same as ours, namely a geometrical line, or line-segment",

[35] R. Sorabji, "Aristotle on the Instant of Change", in *Proceedings of the Aristotelian Society* 50 (1976), 69: "'The train leaves at noon', says the announcer. But can it? If so, when is the last instant of rest, and when the first instant of motion?"; J. Rosen, "Physics v–vi versus viii: Unity of change and disunity in the Physics", in *Aristotle's physics: a*

get to know, accurately, where X is during its motion between A and B. The only thing that we know with certainty is that X is moving between A and B. And this is a major issue, especially when someone asks a question about color change between white and black: in which point X stops being white and becomes black. The same happens in house building or embryo development.

At this moment, Zeno's aporetic arguments spoil the lines' harmony: if a runner must reach point B from A, he certainly should pass over every point Cn. Averroes, and his undeclared medieval followers, discussed it with a choral argument: points are limits of lines, they do not compound them, and they are only limits of motion and change, so lines could be contiguous but not points since it is impossible to fill a space between two points with more indivisible points. This task is virtually infinite. Points are potentially lines' boundaries in any line's cut representing motions are represented. That explains the 18-line diagrams in Book 6, since they represent the determination of limits for each motion and substantial change, regarding motion's magnitude (infinite/non infinite), time lapses and the object's composition. I will show an example of those line diagrams that gathers the vocabulary: time magnitude, motion magnitude, and speed proportions between two objects, A and B. The diagram shows how a motion has a proportional relation between motion's parts and time lapses with the totality of its pathway, according to the speed of both objects. The proportion is called by Albertus Magnus *emiolia* – the Pythagorean name for *sesquialterum* – representing a proportion of 3:2 (reason 1 ½-music two tones interval): three parts (*atoma*) of time about two parts of the whole pathway's distance magnitude.[36] Despite the difference in speed – A higher than B – those objects go through the pathway's distance in the same proportion: 3 parts of time for 2 parts of distance.

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critical guide, ed. M. Leunissen, Oxford 2015, 206: "He [Aristotle] purports to prove that when something moves back and forth along a straight line, its successive motions in opposite directions do not compose a single motion. This result, together with other theorems of his physics, entails that there cannot be an eternal motion along a straight line",.

[36] Albertus Magnus, *Physica* VI, 1, c. 1, ed. P. Hossfeld, 458.44-50: "Signetur igitur totum tempus per K L M N et dividatur in tria indivisibilia quae sunt K L M M N Sed eadem ratione idem tempus quod etiam mensurat motum tardi per E Z I magnitudinem secabile in duo, sicut secatur sua magnitudo quae duo sunt sub emiolia ad tria [sesquialterum prop 3 2 1 1 2 quae sunt emiolia ad duo, et illa duo, cum designent idem tempus cum tempore velocis sunt sicut tria atoma velocis".

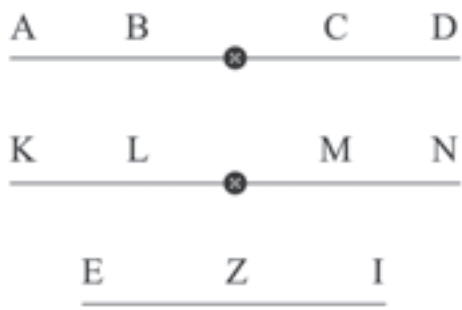

Fig. 1. Albertus Magnus' Diagram

When I saw those diagrams in Albertus Magnus' manuscript from the 13th century and Mantinus' Renaissance edition of Ibn Rushd *Commentarium Magnum*,[37] I realized that the Aristotelian "favorite model of continuum" has quite a long history with plenty of transformations. Indeed, it looks like an aporetic pathway as Zeno's paradoxes.

Visualization Transferences

In Ross' commentary on his edition of Aristotle's *Physics*, there are some diagrams, not in the same quantity as in Mantino's edition but enough visualizations to appreciate the use of this source in manuscript tradition. Ross plainly said that there are diagrams "implied" in the text.[38] About the diagram quoted above, he said that in "some manuscript" the letter (X), which points the limit of the whole pathway, diverges in comparison with others, but Simplicius's commentary shows the same letter. The edition of *Aristoteles Latinus* gathers those diagrams together with *translatio vetus* of Physics.[39] Thus, we can trace diagrams to visualize motion, in medieval manuscripts of *Physics*. The example of Albertus Magnus and Mantinus' edition appears in many manuscripts.[40] Sometimes, diagrams are "implied" in the text, while

[37] Averroes, *Commentarium Magnum*, l. 6, f. 256I.

[38] Aristotle, *Physics*, ed. W. D. Ross, Oxford 1955, 641-642; 660-662.

[39] Aristoteles, *Physica*, l. 6, c. 1-c. 3, 231, b1-234a30, ed. Bossier, Brams et Mansion, 218-228.

[40] Albertus Magnus, *Physica*, Pal. lat. 976 ff. 137r, 141r; Id., Pat. Lat. 976, f. 137r;

others are added as marginalia by another hand. Even so, the diagram itself suffered a modification by a second hand. The key issue, as Albert shows through his diagram, is finding the same proportion for two different motions[41]:

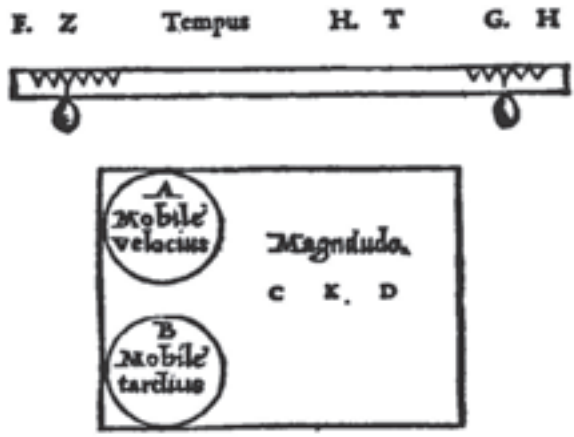

Fig.. 2

CKD *Magnitudo* divisible in three parts

FZ HT GH *Tempus* divisible in three parts

A speed motion; B slow motion

Aristoteles, *Aristotelis Physicorum libri VIII, in Latinum sermonem a <Guillelmo de Moerbeka> translate*, Vat Lat. 2072, f. 45r; Id. BNF Lat. 6318, 26r.

[41] Averroes, *Commentarium Magnum*, 256v; "Ostensum est quod velocius minori tempore transibit aequale, sit id quidem in quo A, velocius, id autem, in quo B, tardius, et sit motum id, quod tardius est, per magnitudinem, in qua CD, in tempore FG, manifestum est igitur, quod velocius sit minori, quidem hoc, mouebitur per *eandem magnitudinem*: et sit motum in tempore FH. Rursus autem, quoniam id, quod velocius est, intempore FH transiuit totam lineam CD, ipsum tardius in eodem temporem minorem transibit, sit igitur in qua CK. Quoniam autem ipsum tardius, quod est B, in tempore FH ipsam CK transiuit, id, quod velocius est, in minori transibit. Quare iterum diuidetur tempus FH. hoc autem diuiso, et magnitudo CK diuidetur secundum *eandem rationem*", Id, 256r; the diagram above quoted by Aristotle: "Quoniam autem tardius quod est ipsum B in eo quod est ZT tempore ipsam que est CK transierit, velocius in minori transibit. quare iterum dividetur quod est ZT tempus. [Iterum itaque dividetur ipsum Z.] Hoc autem diviso, et CK magnitudo dividetur secundum *eandem rationem*. Si vero magnitudo, et tempus", Aristoteles, *Physica*, l. 6 c. 2, 233a5, ed. F. Bossier, J. Brams, A. Mansion, 223.

Tracing motion visualizations in Aristotelian physics manuscript tradition –Greek, Latin, and possibly also in Arabic and Hebraic – could be an encouraging quest. Diagrams work as illustrative tools, a cross-cultural means of teaching physics. The variations between marginal visualizations and inserted text diagrams from commentaries about Physics were certainly inspired by Aristotle's exposition. The text shows the steps to draw the lines, to put them together, to indicate the limits and finally define the notions implied in the comprehension of natural motion and its substantial accidents.

Conclusion: Medieval Diagrammatic Literacy

In another capital letter (see. Img. 1) from a manuscript of *De indivisibilibus*, the character – represented in it – sees and grabs the lines.[42] That image represents the unusual mathematical imagination which medieval masters used to show in some of their works. In fact, the reception of this puzzling treatise, which some think is simply incomprehensible, represents one of the sources to face Zeno's aporetic arguments and the way to introduce the conception – realistic or abstract – of substance's parts continuity like geometrical objects, in which to acknowledge the properties and aprioristic principles of physical demonstrations. For example, this conception justifies the proportional relation between the magnitude parts of motion/change. Furthermore, it contributes to visualizing the measure of magnitudes, distances, time, regarding motion, qualitative alterations, or quantity variations.

On the other hand, Avicenna accepts the Aristotelian arguments about the geometrical model of continuum in a non-dogmatic manner. This perspective introduced by Aristotle in *Methaphysics* warns about misinterpretations due to the "substitution" of geometrical properties in substantial motion.[43] A warning endorsed by Ibn Rushd and his "un-

[42] Pseudo-Aristoteles, *De lineis indivisibilibus liber*, Eisenbibliothek, 20, 30r.

[43] Aristoteles, *Metaphysica*, l. 13, c. 3, 1077b35, ed. G. Vuillemin-Diem (Aristoteles Latinus 25), Leiden 1995: "Et sicut et alias scientias simpliciter uerum dicere huius esse, non accidentis (puta quia albi, si salubre album, hec autem est salubris), sed illius cuius est unaqueque (si salubre salubris, autem in quantum homo hominis), sic et geometriam. Non si accidit sensibilia esse quorum est, non est autem in quantum sensibilia, non sensibilium erunt mathematice scientie, non tamen neque preter hec aliorum separatorum".

confessed" followers. Thus, in his example about local displacement in comparison with qualitative alterations, he states that the motion could be predicated as *transference* (*transfero*, to carry along; to transform) in a univocal way, of a displacement from Thebas or Cordoba as well as to color change.[44] This transference occurs in body parts and in the parts of in body parts and in the parts of distance in the journey to Cordoba. That remark is quite logical and linguistic, but slightly inspired by Avicenna's univocity of *quantum defluens* and its continuity, as we have seen at the beginning of this paper, and it is used in Averroes' commentary on *Physics*: his concern is linguistic, which makes me wonder why Mantino's edition use the diagrams of Latin tradition of the Aristotelian work reproduced by Albertus Magnus.

The common background of motion visualizations, which I have shown in a quick synopsis, leads me to address the occurrence of a medieval "diagrammatic literacy" – the competence to translate conceptual patterns, linguistic interpretations and perceptible phenomena in visual outlines. The intuitive display of these aspects emerges in manuscripts in different ways, in dialogue with the philosophical questions and their interpretations. An appealing example of this "diagrammatic literacy"[45] is Henry of Harclays' interpretation about the superposition of bodies in the same place.[46] For Aristotle this is not possible, but according to Henry of Harclay this superposition took place when the *Corpus Christi* lays on the Virgin's uterus without any material extension. How was this possible? Henry tells us that it happens in the same way as two equal lines lay one over the other, or a line draws on the edge-point of another line to generate a latitude.[47] The motion of the points and lines produce geometrical surfaces and solids. Henry said

[44] Averroes, *Commentarium Magnum*, ff. 256, 228.

[45] J. Hamburger, *Diagramming Devotion: Berthold of Nuremberg's Transformation of Hrabanus Maurus's Poems in Praise of the Cross*, Chicago 2020, 15-18; About the different levels of literacy and its relationship with visual representations, M. Camille, "Seeing *and* Reading*:* Some Visual Implications of Medieval Literacy and Illiteracy", in *Art History* 8 (1985), 32-37; A. Dow, "Interweaving Methodologies: New Approaches to Visual Literacy in Medieval Manuscript Reception", in *Learning to See: The Meanings, Modes and Methods of Visual Literacy*, ed. M. Heitkemper-Yates and K. Kaczmarczyk, Leiden 2016, 131–133.

[46] Henricus Harcleius, *Ordinary Questions* q. 21, 38, ed. M. Henninger (Auctores Britannici Medii Aevi 18), Oxford 2008, 836.

[47] Henricus Harcleius, *Ordinary Questions*, ed. Henninger.

this proof is not miraculous, it is rather imaginative. Thus, he suggests

> Verbi gratia: Ymaginemur superficiem unam erectam, alia superficies posset cum illa esse in eadem profunditate; ponamus duas superficies simul existentes simul moveri ad aliquam partem, et superficies in motu suo causat corpus sicut linea fluens superficiem et punctus lineam [...] Ista duo ymaginative, licet non ita sit in re, sed hic dico quod possibile est ymaginari possibilitatem.[48]

The dynamic of geometrical solids represents the ideal of "diagrammatic literacy" echoed by Avicenna *quantum defluens*, or Albert's *fluxus puncti*, and the expressions of mathematical objects that are the illustrative source of *scientia naturalis* according to Averroes.

Universidad Nacional de Educación a Distancia - UNED

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[48] *Ibidem*

Fig. 3

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